A study of Educational Psychology

R.P. Bhatnagar

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STATE INSTITUTE OF EDUCATION ★ BANIPUR ★

A STUDY

of

EDUCATIONAL PSYCHOLOGY

STATE INSTITUTE OF EDUCATION
BANIPUR

by

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(Thoroughly Revised and Enlarged)

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Preface to the Second Edition

I must thank all the readers who have favoured this book and have made it a part and parcel of their studies of Educational Psychology. The running out stock of the first edition has encouraged me to revise the book and make it more useful and complete for the students of various universities and colleges.

I have tried my best to keep this end in view. The book has been thoroughly revised. New chapters have been added and old chapters have been thoroughly reorganised with certain important and useful additions. To each chapter are added model questions and standard reference books.

I hope the coming generation of students will derive greater benefits out of this edition.

I express my sense of gratitute to all those publishers and authors whose publications and works have been cited as references in this book.

I also express my sense of indebtedness to my wife, without whose help and indirect co-operation, I could not go ahead with this work.

R. P. Bhatnagar

Aug. 30, 1959
Kanungoyan,
Moradabad.

Preface to the First Edition

In the course of my teaching I realized that no available book on Educational Psychology was handy as well as comprehensive enough from the point of view of the examinatior and the courses of the L. T. Examination of the Education Department of U. P., I realised the difficulty and the urgent need of the pupil-teachers. The difficulty and the need of the pupil-teachers were heightened all the more when the syllabus was revised and reorganized in June 1953, resulting in certain new additions such as developmental psychology, motivation and psychology of personality. With the insistence of my students I got this book ready for their help.

The book comprises a bird's eye view of current knowledge in Educational Psychology and its application to teaching and learning. In this, the information and matter have been brought up-to-date in accordance with the latest development in the field and the latest syllabus outlined by the Education Department of U. P. for the L. T. Examination.

The application to and significanece in education of each topic have been specially treated.

Attempts have been made to avoid details and making the book bulky, taxing upon the purse, time and energy of the students. Material and information—given simply in points with brief explanations—have been arranged in a logical way.

The book will also be very helpful to the B. T., B. Ed. and B. A. students in preparing educational psychology for examination. It may also help the M. Ed. and M. A. students in giving them a whole view in outline of Educational Psychology.

I have necessarily drawn on the writings of several authors and I record here my sense of indebtedness to all of them.

I wish to express gratitude to all my B. T. and L. T. students who inspired and spurred me to write, and to my sister Vinod Varma who carefully edited and rewrote my class notes and helped to make the book readable.

I am also indebted to two of may present students, Mrs. Jugal Kishore and Mr. Prithi Raj Wasson who helped in seeing the book through the press.

It is a pleasure to me to dedicate the books to my B. T. and L. T. students.

January, 1954.
Kanungoyan,
Moradabad

R. P. Bhatnagar

STATE INSTITUTE OF EDUCATION ★ BANIPUR ★

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CHAPTER I

EDUCATIONAL PSYCHOLOGY : ITS MEANING, SCOPE AND METHODS

MEANING AND NATURE

Educational psychology is a phase of education. It is a science that supplements the process of education. It is a branch, a segment of education. It describes the behaviour of the educand and seeks to explain it in terms of his inner urges, motives, drives and the environmental influences to which he is subject. It is a study of child's mental life in its various aspects with reference to its application to the education of the child.

Life is a long continuous process of learning and adjustment. Education is to facilitate, to ease and to further this process. Educational psychology is to study and to investigate the way in which this has to take place. Thus, educational psychology provides the teachers and the educators with a fund of knowledge that may help them in giving to the pupils the best kind of education—the education that causes an all round development of the pupil's personality.

Educational psychology studies the problems of education in terms of psychology. In other words, it is a psychological approach to education.

EDUCATION AND EDUCATIONAL PSYCHOLOGY

But it does not mean that Educational Psychology is identical with Education. Part can not be identical with the whole. Educational Psychology, though a phase of education, is quite different from it in certain aspects. Education has a wider field, while functions of Educational Psychology are limited. Following are the main points of difference.

1. Education is a comprehensive scheme of life. It is very much concerned with aims, ideals, purposes, values and stand-

ards of life which are beyond the scope of Educational Psychology. The aims and ideals of education are determined by Philosophy, not by Educational Psychology.

2. Educational Psychology is a positive science. It deals with facts as they are. It studies the laws of the child's nature as they are and as they operate. It has nothing to do with what 'ought to be'. Thus, it is not a normative science. Education is a normative science which has got certain norms and standards. Educational Psychology gives the educator only an insight for devising the best means of achieving these norms and standards.

3. Education demands the Educator to know the child as well as the subject. The first demand of knowing the child is fulfilled by the science of Educational Psychology. Educational Psychology helps the teacher in adjusting the process of teaching to the needs and capacities of the child. Thus, Educational Psychology puts into the hands of the teacher the best means of educating the pupils, though the aims of teaching he has to borrow from another science. Educational Psychology tells the teacher how to teach the child with maximum efficiency and greatest effectiveness. Educational Psychology brings a message to the teacher that environment carries a great weight in the education of the child. It reveals to him that every child has a psychological nature and all teaching should be adjusted according to that. Thus, Education is benefitted by Educational Psychology in this way.

4. To some, education appears to be only applied psychology. This is not true. Education is one word, but many things. Education includes both the means as well as the ends of education. Educational psychology studies only the means. Ends are outside its purview.

GENERAL PSYCHOLOGY AND EDUCATIONAL PSYCHOLOGY

Sometimes, Educational Psychology is confused with General Psychology. Though there is much common to both, yet their objectives are very much different from one another. The field of General Psychology is wider. It deals with every kind of human behaviour and with every kind of problem related to life. All forms of life-processes, adjustments, activities and experiences of the organism may become the scope of General Psychology. General Psychology deals with, explains and interprets the facts of human behaviour and experience in a general way.

Educational Psychology deals with the behaviour and experiences which are related to education only. It selects from the whole field of General Psychology those facts and principles that are of specific significance to learning and teaching.

Thus, Educational Psychology is just a specialized branch of General Psychology.

ITS HISTORY

Educational Psychology has a very short history. It has developed only recently. Previously, it was simply an application of the principles of General Psychology to Education. It had no subject-matter and field of its own. Only a few principles taken from general psychology which could be applied to Education formed the whole of its content and no such science as an Educational Psychology was in existence. Educational Psychology as a separate and independent science in its real sense was born in 1900 A.D. when Thorndike, Judd, Terman and others were appointed to definite university posts to cultivate the field. But the progress was very slow. It took definite shape only in 1920. Since then, it is a separate and independent science having its own field of investigation. Yet, it is only in infancy. No doubt, General Psychology still goes a long way in helping those who work in the field of Educational Psychology, yet, its boundaries are becoming more clear and apparent in the shades of General Psychology. Since its birth in 1900, its province is continually changing. New problems and aspects of education are being touched e.g, possibilities of education in nursery schools, adult education, democratic way of life in schools, teaching childern to live and love. Recently researches have been made in the education departments of various Universities on 'Errors in Algebra', reading interests of boys and girls of different ages, etc.. These investigations come purely within the purview of Educational Psychology.

Thus Educational Psychology today has assumed a very independent role, having its own problems and its own field of work.

EDUCATIONAL PSYCHOLOGY TODAY

Thus, the main characteristics of Educational Psychology of today are :—

1. It has created its own field, own data, own subject-matter.

2. Principles of general psychology are still accepted but with a critical attitude and only in the educational background.

3. There is, now, an extensive literature describing the results of actual experimental try-outs of the suggested applications. In many cases it has been found out that applications of the principles of general psychology did not work well.

4. Applications of the principles of general psychology, now, have to stand the test of experimental investigations taken by educational psychology.

5. Educational psychology is, now, a field of specialization. It covers how to teach-school subjects, new types of activity programmes, diagonosis of and remediation of educational difficulties, educational attainments, improvements of practice in nursery schools and educational guidance etc.. These are the specific problems which educational psychology has to study.

6. Educational psychology of today adopts a special professional point of view which is different from that of general psychology. Educational psychology aims at developing professional practices of maximum value.

7. Yet, educational psychology can not be very clearly defined. It is just what the educational psychologist does.

CONTRIBUTION OF EDUCATIONAL PSYCHOLOGY TO EDUCATION

It is said that Educational Psychology has revolutionised the process of Education. It is true. New education is a complete departure from the old.

In the scheme of old education the child had no place. Discipline was very rigid and repressive, curriculum was fixed and formal and the whole of education was drifting away from the life of the child.

New education is not mere acquisition of knowledge and information. It is modification of the child's behaviour and an all round development of the child's personality. New education is for the child and apart from child it has no purpose. Thus, in the picture of new education it is the child that figures most. This conception is a gift of Educational Psychology. Educational Psychology has revealed that all possibility of education lies in the potentialities of the child and his nature. Rousseau said, "study the child as we do not understand him." To him child was a book which had to be studied by every teacher. In this way as a result of the insight given by Educational Psychology a new child-study-movement has started in the field of education. Introduction of this science to Education has brought about a revolutionary change in the field of education. In other words, they say, education has been psychologised. This change has shifted the emphasis from matter to the child. All that is to be taught to the child should be determined by the nature, needs and capacities of the child himself. In the same way, introduction of psychology to education has also changed the conception of discipline. Discipline in the new education should be positive, not negative.

A greater contribution of psychology to Education is the new and improved methods of teaching. Psychology of interest, psychology of play and learning have completely revolutionised the process of teaching. 'Learning by doing', 'teaching through visual aids', Project Method, Dalton Plan, Kindergarten all are the gifts of Educational Psychology to education. The new curriculum has been widened and is based upon the needs of the child. New principles of curriculum are greater principles of Educational Psychology.

Thus, introduction of psychology into the domain of education has brought about phenomenal changes in the matter and method of education. It has raised the child up and has brought all other factors in education in subservience to the child. Thus, education has been revolutionised by the science of educational psychology.

OBJECTIVES OF EDUCATIONAL PSYCHOLOGY

Nature, scope and objectives of Educational Psychology are determined by the relationship, it bears to the aims and standards of Education. The aims and ideals of education are set by philosophy. Educational psychology helps in realizing these goals and ideals. It helps primarily in answering questions of 'how' and 'when'. How does learning of facts differs from learning of attitudes and purposes ? How can appreciations and ideals be best developed ? How can prejudices be uprooted ? How can a problem be memorized most economically ? How should a child begin learning to read ? Psychology can help us answer these questions.

Fundamental aim of educational psychology is to help the student of education and the teacher in understanding human nature so that he may be able to motivate and direct the learning and growth and conduct. Charles Skinner gives two objective—cultural and professional. By the first he means that educational psychology has to enrich the life of the educator himself by changing for the better the learner's thoughts, feelings, attitudes, ideals, standards of values and conduct. By the second he means improvement in the quality of instruction.

Besides this general aim as stated above, there have been mentioned various specific aims. They are given by Charles Skinner as :—

1. A growing conviction in the usefulness of the science of educational psychology.

2. To assist in defining and setting up educational objectives and standards in terms of desirable behaviour and organizing educational situations in which such a behaviour may be brought about.

3. To develop in those who teach, a sympathetic attitude towards children.

4. To provide a body of facts and principles which can be used in solving the problems of teaching e.g., how the

material of instruction can best be selected and organized into a graded series of problem, projects, units or contracts, how these can be used intelligently as means in developing the desired outcomes etc..

5. To aid in providing the teacher with a better perspective for judging both the results of his own teaching and the educational practice of others. Educational psychology aids in providing a better background for understanding the total job of teaching in all its intricacies.

6. To assist the teacher in giving the necessary facts and techniques for analysing child's behaviour to facilitate adjustment and growth of personality.

7. To assist in setting up, defining and maintaining progressive teaching procedures, guidance programmes and functional forms of organization and administration.

ITS SCOPE

As education is co-extensive with life, so are the problems of Educational Psychology co-extensive with life. Its scope stretches from conception to adulthood.

The subject-matter of psychology includes activity, mental functioning, behaviour and experience. The scope of Educational Psychology is limited to human-behaviour in educational situations.

Thus, development and growth from conception to maturity, learning individual differences and measurements, personality, adjustment and mental hygiene, group psychology, educational guidance, vocational guidance, development of sentiments, habits and character, improvement of methods of teaching, all come within the field of educational psychology.

METHODS

The facts and principles of Educational Psychology are the results of scientific investigations by competent persons. The more specific and important methods used by Educational Psychologists are the following :—

1. *Subjective*

   To this type belong Introspection and Retrospection and Anecdotal Method.

2. *Objective*

   This includes objective observations, Questionaire Method, Case Study Method and Experimental Methods.

SUBJECTIVE METHODS

1. INTROSPECTION

It means "to look within". Practically it means systematic process of self-observation. According to this method the psychologists look within the minds to discover how the subject thinks, reasons and imagines and then they suppose that the process of thinking, reasoning and imagination is the same in case of others too. Therefore, they ask other individuals to report what is going in their minds and what they are feeling within themselves.

The advantages of this method are many. Firstly, it is very simple and requires no equipment and apparatus. It can be applied anywhere and at anytime. This is applied by those who experiment in all sorts of investigations for interpretation and verification. It is very useful in all kinds of observations.

However, it has several disadvantages. Firstly, it is unreliable because it is difficult to remember part processes and impressions. It is, said, therefore, that one cannot introspect in mental process due to untrustworthiness of the memory process. Mental processes change so rapidly that observation fails to record them. Thirdly, it cannot be applied to animals, children, defective and insane persons, as they cannot introspect. Fourthly, the date of introspection cannot be verified since the mental processes of different individuals are not the same, nor they are same in a given individual on different occasions.

2. THE ANECDOTAL METHOD

It means recording of personal impressions and recounting of earlier experiences. This method is not very reliable as true experiences are difficult to be recalled. Sometimes, authors exaggerate or minimise their past impressions and experiences.

OBJECTIVE METHODS

1. *The Questionaire Method*

This is a form of introspective methods. It was used in England by Galton in his study of individual differences and by Stanley Hall in America. This method is more accurate than the Anecdotal Method. In this, carefully formulated questions are required to be answered by a select list of individuals. The interview is a kind of oral questionaire.

2. *The Case-Study-Method*

In this method a detailed study of an individual's family-history, his early life, school life, home and social environment is made. This study is further supplemented by the use of the questionaire, interview, free association and all other devices which are likely to throw light on the case.

3. *The Experimental Method*

It is an observation of behaviour in a controlled situation. This is the most precise, accurate and reliable of all our methods. In this all the factors that have any influence on the process in question are kept under control and made constant. Only the one is made to vary in a known way and the results are noted.

4. *The Biographical Method*

This method uses the genetic approach. In this, an observation of the growth at various stages or levels of development is made. It is of great importance in the study of infants. It consists of keeping a record of the development of the child as it takes place.

5. *The Method of Tests, Scales Rating, and Rankings*

In the study of individual's capacity to learn, individual differences and achievements, aptitudes and subject matter-difficulties, psychological tests and educational measurements have been used extensively. The test method gives the educator a better understanding and knowledge of the capacities, abilities. achievements and progress of his pupils. Rating and ranking methods are used chiefly in the study of personality

QUESTIONS

1. "Psychology has revolutionized Education", discuss.
2. "Child is the center of new Education," Elucidate.
3. Discuss how the study of Educational Psychology can help the teacher in the education of the child.
4. "Knowledge of Psychology forms the fundamental basis of Education." Examine this statement.
5. Throwing light on the past history of Educational Psychology, describe the present status and objectives of Educational Psychology.
6. What are various mtehods of investigation of facts and principles of Educational Psychology.
7. Discuss the following critically :—
   (a) Educational Psychology is a positive science.
   (b) Education is a normative science.
   (c) Education is co-extensive with life.
   (d) Education is applied psychology.
8. What are main contributions of Educational Psychology to Education?
9. "Study the child as we do not understand him", discuss this statement of Rousseau.
10. Write short notes on :—
    (a) Questionaire Method
    (b) The Experimental Method
    (c) The Biographical Method
    (d) The Methods of Tests, Scales, Ratings and Rankings.

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CHAPTER II

DEVELOPMENT FROM CONCEPTION TO MATURITY

The whole period of development from conception to maturity may be conveniently divided into two parts—development from conception to birth and development from birth to maturity. Development during each period will be described separately.

DEVELOPMENT FROM CONCEPTION TO BIRTH (PRE-NATAL DEVELOPMENT)

Development of the human body during this period will be discussed with reference to two aspects (1) Structural development and (2) functional development. Each of these will be described separately.

I. STRUCTURAL DEVELOPMENT

After the conception, the germ-cell begins to grow. The growth takes place in two ways :—

(a) Firstly, byan increase in the number of individual cells independently.

(b) Secondly, by an increase in the number of cells by cell-divisions accompanied by progressive differentiation of functions.

This is the general nature of growth with which the earliest cell of the human body starts.

As regards structural development, the whole pre-natal period may be divided into three parts :—

1. Germinal Period (First two weeks after conception).
2. The Embryonic Period (From 3rd to 8th week).
3. Fetal Period (From 8th week to the time of birth).

1. THE GERMINAL PERIOD

The fertilized ovum at first is unattached and free-moving. The human body during this period is an egg-like organization. By the end of the second week it becomes implanted in the tissues of the uterus of the mother. From this time the developing child exists parasitically, receiving nourishment from the mother and growing rapidly in size.

2. THE EMBRYONIC PERIOD

During this period there is a rapid change in the size and form of the implanted body. In the beginning there appears a germinal disk between "amniotic" and "yolk" sac. The cells lining these two cavities differ in character and development. Those towards the "amniotic" sac constitute the "Ectoderm" from which the nervous system and the skin develop. Those lining the "yolk sac" are "Entoderm" cells. In embryonic life they are nutritive in function and develop into the digestive and respiratory tracts. From these two develops "Mesoderm". Out of this develop skeletal and muscular systems of the body. The disk is first flat and convex. But soon thickening and ridges develop parallel to a principal axis and it gradually becomes elongated and tabular.

The manner in which the differentiation of the parts of the embryo is accomplished is not known. The globular form of the original mass exerts an important influence. If the position is changed, altered characteristics are found. A cell, cut from one place and put at the eye-region, may develop into an eye.

Certain chemical substance like "organizers" also guide the differential development of the cell. They, when applied to other portions, will produce anomalies.

The degree in metabolic activity has also been found to be responsible for differentiation.

Certain environmental influences may also affect the nature of development e.g., application of light, electric field, X'rays, gravity and chemical influences have been found to have affected even the direction of the axis around which the embryo develops.

"Pre-natal growth is not, therefore, just by nature but is influenced both by the cell-structure and by the conditions of development."

3. The Fetal Period

During this period there is rapid growth and increase in the number of cells in the early part of the period. In the latter part there is an increase in the size of the cells.

Development of the Nervous System

Pattern of nervous-system is laid down in the embryonic period. The first groove in the ectoderm folds inward to make the neural tube. Greater part of this develops into spinal cord. Upper part is further differentiated as the brain.

During the fetal period there is great neural overgrowth. This fact has been significant for learning and development of intelligence.

The development of neural structure precedes that of the muscles and of sensory receptors.

Sensory mechanism also develops during the pre-natal period. Structural changes that precede the development of vision begin very early, probably in the second week and gradually develop until sometime after birth. The olfactory mechanism are sufficiently mature and function in the case of infants born one month prematurely. Taste-buds appear early during the 3rd fetal month. Muscular and deep-pressure senses and skin senses function very early.

Laws of Structural Development

Thus there are two laws of "structural development":

Law of "Cephalocaudal" and "Proximodistal" development or the law of "developmental directions." Jackson and Scammon state that "it is generally found that development in the long axis of the body appears first in the head-region of the body and progresses towards the tail region."

Both have been found significant in tracing the beginning of functions as well as of structure.

2. FUNCTIONAL DEVELOPMENT

A. Motor Responses

Pre-natal development of behaviour assists greatly in understanding the nature of the new-born child. Fetus makes movements while still in the uterus as early as the 14th to the 16th pre-natal week. Mothers usually feel them. Beating of the fetal heart reaches sufficient magnitude by the 18th week. Movements of the digestive system may occur as early as the 7th week. Contractions of the stomach and periodic tonicity are found among the very pre-mature. Crying occurs among premature infants born in the sixth fetal month.

Upto a certain stage, the organism is non-motile and does not respond to tactual stimulation although the separately developed muscles and segments can be stimulated electrically. The early flexure stage appears rather suddenly. The lower part of the body is not, yet, sensitive. With further maturation, the bending response extends down the entire body producing the coil-reaction.

Then, at first the legs move. Then, in succession in movements the knees, the feet and the toes appear. Coghill says that earliest movements involve a "massive action of the body entire". Maturation consists of the progressive differentiation of more specific movements which are "carved out" of the primarily integrated pattern of behaviour.

A good deal of data has been provided to us by Minkowski of Switzerland and Hooker of America. The latter data were recorded by motion pictures.

Principles of Motor Development

There are three principles of motor development:

1. Coghill's principles of mass activity or individuation.

This principle is also followed even after birth. Coghill states "the nervous system concerns itself first with the maintenance of integrity of the individual and only makes provision for local reflexes."

Development of function also follows the two principles of the development of structure i.e.,

2. The Cephalo-caudal sequence and
3. Proximodistal.

The first responses in all animals are elicited in the upper region of the body and then they progress downward. Development is also seen in the individuation of functions.

An interesting hypothesis advanced in various forms by Kuo, Holt and others call attention to the role of environment and stimulation in the development of specific behaviour and the function even before birth. According to this view a reflex first occurs as part of a total pattern of reaction initiated by internal stimuli. If certain stimuli are simultaneously present whenever a given reaction is made, a connection will be formed by the simplest mode of learning, the conditioned reaction. In this way many reflexes may be acquired because its stimulus, pressure on the palm-surface of the hand occurs whenever a fist is clenched.

B. SENSORY DEVELOPMENT

The human fœtus is senstitive to light cutaneous sitmulation from the 8th week onward. Responses to pressure and temperature also appear before birth. Skin sensitivities develop first in the neck and head region and then progress downward to include the surface of the rest of the body. In response to a light touch or stroking there is a tendency to move the stimulated part toward the stimulating object. Strong stimulus produces violent response. The same types of reactions appear after birth.

Pain sensitivity is poorly developed even in late fetal life. Responses to intra-organic stimuli are quite evident during pre-natal stage.

Eye-movements may be evoked before birth, although not by retinal stimulation. Prematurely born infants may differentiate between light and dark and show the iris reflex.

The mechanism for smell and taste are present in the prenatal stage, but they receive no adequate stimulation even until after birth. Smell reactions have been found in pre-maturely born children.

Recent experiments show that the fetus may respond to loud sound, a month before birth. Charles Brook holds that this may not be due to an auditory response but one to tactually sensed vibrations.

Conclusion

Thus, study of the pre-natal growth is of great significance. It emphasises upon:—

1. Primary integration of behaviour.
2. The continuity of development.

The study of pre-natal development has revealed that birth is, now, no longer the zero point in human conduct, but that it is only an incident occuring in a continuous process of growth and differentiation. This concept breaks down the absolute barrier between 'reflex' and 'habit' and between 'native' and 'acquired'.

These principles are serviceable in the study of post-natal as well as of pre-natal growth. Modern psychology regards the child as an integrated and continuous growing organism developing under the inter-acting influences of his own structural characteristics and the environment about him, both before birth and after birth.

DEVELOPMENT FROM BIRTH TO MATURITY

Insight into the nature of growth and development of the human being is fundamental to an understanding of teaching and learning.

GROWTH AND DEVELOPMENT

Let us first distinguish between growth and development.

Growth and development are two different processes. They are quite different from one another and no correlation is found between the processes of the two.

Growth refers only to increase in size of part and the consequent changes in size and shape of the body as a whole. It is the result of increase in number or size of the cells.

Development indicates changes in character and connection of cells. A child may be quite large for his age, but poorly developed. Development refers to co-ordination and integration of the cells. Nerve-centres are less capable of growth, but have greater capacity for development which is not complete at even twice eighteen. The increased mental power is the result, not of changes in individual cells, but of changes in those connections between cells which make possible the use of many parts of the brain in the accomplishment of a single purpose.

Rapid growth should be followed by a rapid change in development.

PRINCIPLES AND GENERAL NATURE OF GROWTH

1. Every organism begins as a single cell and by taking and transforming nourishment it grows into an individual of its own species.
2. All increase after birth is the result of enlargement of cells, thus formed.
3. The body of a child is composed of about as many cells as that of an adult. Hence, growth is by enlargement of individual cells.
4. An organism does not grow forever, nor the rate of growth is uniform. It grows at a varying rate till the size of its species is attained. Then it stops.
5. It is not possible to change the rate, amount and direction of growth except within narrow limits by changes of food and surroundings.

6. Each species is so organised that its size of growth during a certain time and its life are determined largely by the number of elements in the germ cell. If the embryo of a frog is divided into two or four parts, each part will develop into a whole frog but of a correspondingly fractional size and length of life.

7. Growth is the product of the interaction of the organism and its environment. McGraw defines growth as "a process resultant from a constant flux or interchange of energies within an organism and energies within its environment." Thus Heredity and Environment are two great factors in the growth and development of the child.

8. Growth is continuous and gradual rather than saltatory process. It means that sudden transformation in the development and growth of the child never appears. Yet, it does not mean that growth is uniform all through life. Growth is rapid at some period and slow at others. Different physical and mental traits grow at different rates and reach the limit of development at different times. This fact has made chronological age quite unreliable basis of estimating maturity. In other words, it is said that the child has many 'ages', mental age, physical age, social age, emotional age and so on. This fact is very important for the adequate adjustment of children to the school environment at every level of education.

9. Growth proceeds most rapidly in the early years of life. The infant at birth is five million times as large as the original germ cell. It is agreed that in infancy the rate of general physical growth is more rapid than at any subsequent time. After birth most rapid growth is during the first year when it is nearly thereefold. From this time an increase in size is less rapid and the rate slightly decreases till about the eleventh year. After the eleventh year there is an acceleration in growth, first in height, and then in weight.

10. Acceleration in growth begins earlier in girls but lasts longer in boys. In both, the stage of rapid growth at puberty is preceded and followed by a period of slow growth, and, again, in both, rapid growth in height precedes rapid growth in weight.

11. Growth is complete before twenty, at least as regards height.

12. Growth is a process of integration as well as differentiation. Older psychologists regarded behaviour-pattern as only synthesis or integration. Structuralists and Behaviourists

were marked for this. The first behaviour-pattern is most general, less localised and less particularized. But Coghill recognises a "process of individuation or analysis within a larger pattern." Irwin holds that the first growth in the behaviour is "mass-activity." The first cry of the child is an example of it. Then, the process of differentiation begins. Language development follows this order. First response "*M-a*" is general and used for all. But soon differentiation begins. Thus, growth proceeds from general to specific. Skinner holds that growth is a "process in which both integration and differentiation play a parallel role, though not always."

13. Measurement of individual children show that in general a period of rapid growth in height or in the length of a limb is a period of slow growth in diameter and vice-versa.

14. The co-efficient of growth is calculated by dividing the weight by height (w/h).

It varies from 0.950 at $5\frac{1}{2}$ years to 1.90 at 17 years.

A boy of 5 years weighs less than one pound for each inch of height and that of 17 years nearly 2 lbs. for each inch.

Coefficient for tall children is greater than that of short children.

15. As regards lung's capacity a definite relation exists between breathing and height at each stage which is measured by dividing the cubic inches of breathing capacity by the inches in height. This is known as the coefficient of lung's capaicity. At the age of $5\frac{1}{2}$ years it is 1.16, at 17 it is 3.5.

16. Greater coefficient means greater maturity. Pubescent at an early age means high coefficient and late in maturing means low coefficient.

17. Mental maturity corresponds more closely with physiological age than it does with chronological age. Therefore, greater coefficient also means more mature mentally e.g., according to De Busk the coefficient of breathing capacity to weights correlates closely with the results of Binet Tests as to mental age.

18. The weight of the brain at birth is 12.29% , of that of the mature body, at 25 is 2.16%. The weight of the heart is .76% at birth and .46% at the age of 25 of that of the body.

19. Shape of the organism also changes with age.

Normal growth is the sign of good health. Very rapid or very slow growth may indicate a poor health.

Rapid growth at the beginning of puberty is the most critical period both physically and mentally.

This fact suggests that guidance in physical growth and development should be one of the principal function of pre-school and elementary education.

EARLY DEVELOPMENT OF THE HUMAN INFANT

Development of Motor Co-ordination

During the first few weeks movements depend more upon general bodily and organic conditions than upon outward stimulation of any of the special senses. Secondly, movements are not co-ordinated and they have little relation to each other. Soon after, outward and special stimuli become more effective e.g., crying and restless movements can be checked by auditory, tactual or visual stimulation such as singing, patting the child and shaking something before the child.

In the second quarter many combinations of movements take place. The lips, hands and feet not only move when touched but move into contact with objects seen. Fixed mental associations of sensations and movements are, thus, formed earlier.

In the next quarter random and meaningless movements are co-ordinated into what we call child's play. Certain movements of limbs or vocal organs change to be repeated in rhythmic and partially co-ordinated movements. In the later part of the first year not only movements are repeated in play, but movements seen and sounds heard are often playfully imitated and repeated over and over again.

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The process of combination goes still further and the child begins to move towards things to maintain equilibrium while standing and walking and in getting up and down.

The most marked change in the movements of a child during the first year is not in number but in complexity, definiteness and co-ordination. These changes are preparatory to and correlated with corresponding changes in the conscious states of the child's mind.

DEVELOPMENT OF VOLUNTARY CONTROL

Development of voluntary control is due to most interesting combination of motor and mental processes.

Every voluntary movement must have a purpose. In complex volitions there is consciousness of several ends and a choice as to which shall be secured or used. It is, therefore, evident that voluntary efforts must be made only after considerable experience in non-voluntary movements, which give a basis for forecasting the possible and probable results of movements in response to familiar stimuli. The muscular and nervous mechanisms are in part the same whether the motion is voluntary or involuntary.

A new state of consciousness or will-force must emerge before some volitional activity can be performed. So a young child is quite incapable of performing a voluntary action.

First, volitional attempts are made in the movements arising in connection with movements of the head in search of the nipple, in turning the eyes towards a moving object. This usually occurs between 4 and 5 months, while a month or later there is shown a more complex voluntary state of representing the exciting stimulus as well as the end to be secured, e.g., the child reaches for what is not in sight.

Muscles of the limb first brought under control are the larger ones of the whole arm, while the space in which the control is first exercised is directly in front and near the level of the mouth.

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Other movements than these of the hand come under voluntary control in a similar way; first, the eyes and head in turning towards sight and sound, then the body in sitting; then, hands in grasping and, finally, near about the close of the first year the legs in creeping, standing and walking and the vocal organs in repeating sounds.

Walking becomes possible when its reflex elements can be properly combined. The tendency to locomotion is fostered by the instincts of curiosity and desire of coming in contact with various objects.

DEVELOPMENT OF EARLY MENTAL STATES

The child sleeps most of the time at first and he is conscious of only more intense stimuli. The field of consciousness, is, at first, a half-formed barren desert with only an occasional rock of bodily pains or oasis of comfort clearly discernible.

Consciousness probably has no influence upon action for several months, but gives nearly an imperfect report of what is being and has been done. It has been described like a log-book of the first voyage of the vessel of life in which appear only the regular food-watches and the unusual events of the voyage.

Consciousness is very little unified in the first quarter. In the second, it becomes unified in a corresponding degree and every experience becomes associated with others, like or contiguous to it. Then, it becomes general director of affairs. Every new experience illuminates and enlarges the field of consciousness and extends the control of growing self.

SENSORY AND PERCEPTUAL DEVELOPMENT

During first two years of life children are able to perceive many differences as shown by their comprehension of language. They show skilful discrimination of sound and perception of visual forms at two years e.g., to point to pictures and objects when asked as "show me the shoe" and so on. It has been discovered that children can identify differences in position at two and three years as in knowing "on", "in", "beyond" etc., Such activities together with those underlying a wide range of motor, linguistic, social and other adaptive activities indicate the increasingly effective perception-differences. Reasoning abilities of children at two, three or four years also pre-suppose considerable discrimination of likeness and differences.

Sensitivity to pain is present even at birth. It decreases with age.

Ability to discriminate simple colour matures rapidly from the age of 1¼ years to 4 years. Cook performed an experiment with 110 boys in naming and matching of red, yellow, green and blue colours in which 45% gave correct responses at two years of age, 80% to 90% at 4 years of age. Visual acuity begins to taper off at about the age of twenty and declines quite sharply after fourty.

Experimental evidence shows that all normal children have a well stabilized concept of relative loudness of sound by the age of 4 years. Beginning before twenty there is a falling off in hearing.

Tactual perception is not found well-developed in early childhood. It decreases during adolescence.

Ability to perceive differences in the pitch of tone and in the shades of colours probably increases during adolesence.

Maximum acuity in the sensory development reaches at about three years of age.

Individual differences in sensory development are due to heredity, age, disease and accidents.

QUESTIONS

1. Give a brief account of the structural as well as functional development of the child during the pre-natal period.
2. Describe the laws of structural and functional development of the child followed during the pre-natal growth.
3. What is the significance of the study of pre-natal development ?
4. Describe the principles and general nature of growth.
5. Write short notes :—

(a) Early motor co-ordination.
(b) Development of voluntary control in infancy.
(c) Development of early mental states.
(d) Early Sensory and Preceptual development.

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CHAPTER III

STAGES OF DEVELOPMENT, THEIR CHARACTERISTICS AND EDUCATIONAL SIGNIFICANCE

In the previous chapter we have seen that growth and development are not uniform at different ages, nor the rate and growth of development are the same all through life. It has been discovered that different physical, mental and emotional traits grow at different rates and reach the limit of development at different times. This means that the life of the child may be conveniently divided into various stages or levels of growth and development. The nature of growth and development indicates that various aspects of personality grow at different rates and at different ages. This means that the life of the child consists of certain rhythmical periods of growth. Each period has its own characteristics, laws of development and adaptability. Therefore, adjustment of children to the school environment at every level of education is very necessary. Effectiveness and efficiency of education lie in the fitness and adjustment of this type. This fact has resulted in the division of human life into various stages of development. Dr. Earnest Jones in an important paper, "some problems of adolescence" has pointed out that human development takes place in four well-defined stages. They are:—

1. Infancy, upto five years.
2. Late childhood, from 6 to 12 years.
3. Adolescence, from 13 to 18 years.
4. Adulthood, beyond 18 years of age.

CHARACTERISTICS OF VARIOUS STAGES

A. INFANCY

1. Intellectual development is not much. Yet, Earnest Jones says that the child has a bold initiative of thought, sear-

ching spirit of enquiry and these become blunted by increase of age.

2. (a) His behaviour is instinctive and these instincts clamour for immediate satisfaction.
   (b) Impulses act independently. They are not well integrated and personality is not well-spun.
   (c) He has the lowest stage of moral development, conduct being motivated solely by instinctive and pleasure-pain , principle.
   (d) Reward and punishment are the only means of his socialization.

3. He has an attitude of dependence. He depends upon the parents and other members of the society for the satisfaction of his physical as well as emotional needs. He seeks for love and approval of others.

4. The instinct of self-assertion is dominant and the child is always endeavouring to become master of the situation.

5. Natural rhythm of submission and elation is present all through his life. This is tremendously important characteristic and must be taken into account by the teacher in all his dealings with his pupils.

6. Infancy is an age of auto-erotism or self-love.

7. Exuberance of imagination is also a great characteristic of this state. It is an age of fantasy in which the child finds compensation for harsh realities of actual existence.

Emotional and Social Life

The young baby has an active emotional life. His feelings are unstable and intense. He has no control over his emotions. He is always afraid of being deserted, hungry, lonely and helpless. Fear is very acute feeling in the young baby.

From 2 to 5 years, the child is highly emotional. Emotional life of this stage also influences the social development of the child. Child's emotional relationship towards the parents, adults and siblings is of great importance as what the child will be socially is determined by these relationships.

Following stages of social development have been described:—

A.	(1) Dependence on adults.	(13 months to 2 years).
	(2) Independence, defiance.	(2 to 3 years).
	(3) Co-operation.	(3 to 4 years).
B.	(1) Aloofness.	(2 yeas).
	(2) Aggressiveness.	(3 years).
	(3) Friendliness.	(4 years).

This shows that first the child is highly dependent on adults, then he becomes independent and then co-operative. As to his relations with other children he first tries to be aloof, then he becomes aggressive and after that develops friendliness.

Intellectual Life

Intellectual development of a small baby can be gauged from his early attempts at speech and other sensations which he feels and distinguishes. The child experiences many kinds of sensations such as hardness, coldness, pain, pleasure, sensation of sound sight and smell. The child can compare various sensations. He can recognise simialrities. In other words development of percepts and cencepts has begun. He learns that things have certain qualities of their own. He is able to organise his thoughts and make simple generalizations—though all these are very rudimentary. He is able to solve some of his problems. As the child grows up he picks up new interests in the outside world and the intellectual development is quite rapid. At about the age of 5 years he is capable of abstract reasoning and logical thinking.

B. LATER CHILDHOOD. (A PERIOD OF PSEUDO-MATURITY, 6-12)

1. At this stage we find remarkable stability both physical and mental, that is, it is a period of consolidation. Children are rather at ease with surrounding world and they have achieved a degree of adjustment to environment.

2. The only new change that we find at this stage is the ripening of the gregarious instinct. He moves in a company and has his own society.

3. The child has his own moral code and is faithful to his own group. His morals are ruled by public opinion, social praise or blame.

4. He becomes extrovert and he develops an outward outlook. He takes interest in the outside activities and games. He tries to gather as much information as possible regarding the external objects.

Emotional Development

This period is also called latency period. In this period tublulent emotions of the early years are not active. They are latent and dormant. At this stage the child is able to control his feelings and emotions. He is able to face the world and is not easily disturbed by antagonism, unkindness. Sometimes children rebell, take delight in defiance and disregard of authority.

Social Development

The child at this stage achieves greater sociability. He likes to make friends, but friends of the same sex. Girls like girls, boys like boys. Social groups are larger than those of previous stage. The basis of friendship is mostly the common interest. This period is sometimes called "the gang age". That is why juvenile organizations such as scouts, guides, camping, clubs are very much liked by them. The child of about 11 years can appreciate good leadership, careful organization and new interests.

Intellectual Growth

The child has enough developed his intellect by now. He can define words, detect similarities and absurdities, can reason fairly well. Memory is well-developed. The memory span for digits at different ages is found to be as follows:—

4 years……4; 7 years……5; 10 years……6.

Interests

Children between 5 and 11 years have a great variety of interests. They have genuine interest in collecting things. They like to collect almost anything—leaves, stones, cloth-pieces, pencils, chalks, lead-balls, tickets, cards, books, butterflies, wild flowers and so on. Boys are more boisterous and energetic than girls. Girls prefer less active games. Playing dolls becomes less popular and interesting after the age of 8 years. Following have been found dominating reading interests of the school-boys of different ages.

7 years	Realistic stories, Animal stories, Stories about home-life Fairy tales, Funny stories, School stories,
9 to 11 years	Heroic, mystery and adventure stories. Myths and legends Elementary scientific literature Books about hobbies.

C. ADOLESCENCE

1. This is a period of simple recapitulation of infancy which no longer exhibits the stability that marked later childhood.

2. This is a period of great stress and storm because a few new instincts and emotions emerge and disturb the personality of the adolescent.

3. An attitude of dependence is again seen. The dependence, however, is not on parents, but on heroes found in real life, in history and in literature. Teachers are liable to be exalted into the position of hero. So they should deal with the situations in the best interests of their worshippers. Adolescent-hero-worship may result in sentiments of love for the moral qualities of his hero.

4. Gregarious impulse becomes sublimated into definite forms of social behaviour. Ideals of social service are formed, love of

mankind develops and creation of ideal society becomes the heart-burning desire of the adolescent. The teacher should direct these altruistic impulses into fruitful channels.

5. The adolescent is unstable and unadjusted with the surrounding world.

6. The adolescent leads highly emotional life and so is changing in the states of mind. He is intensely excited or deeply depressed.

7. There is exuberance of imagination. He is intensely self-centered and introvert, withdrawing himself from the real world.

8. Sex instinct is the most prominent feature of the period. "Like the overflow of a great river" says Slaughter, "it irrigates and fertilizes great tracts of life-territory." So moral character is chaotic and sublimation is required for this instinct.

9. Intellectual development is reaching its maximum.

To prevent the perversion of sex activities and characteristics the adolescent should be kept busy in physical activities and he should be made to avoid situations which excite the instinct wrongly.

Emotional Development

Every thing in the world is strange and puzzling to the adolescent. The psychosomatic conditions of the person are disturbed and he is found to be emotionally unstable. He is irritated and moody. Feelings are always very tender and overwhelming. They fluctuate very often and swing from elation to despair very rapidly. The adolescent is very touchy and sensitive. He becomes introvert and moves in the inner world. He is generally in the thinking mood. Sometimes he is over confident and sometimes much depressed. He is highly critical.

Social Development

The adolscent is, now, preparing to be the man of world. His relations with his parents undergo a definite change. Actions and opinions of his parents become now a matter of criticism for him. He does not submit to them uncritically; rather defies their authority and flouts their opinion. He challenges their views and beliefs. Secondly, religious feelings become more important for him. He is more inclined to accept the leadership of the persons outside family such as teachers learned persons, film stars, players, etc., In other words this is an age of hero-worship which may result in frustration or loss of contact with reality or disillusionment. He may have day-dreams. Hetero—sexual relationships become truly attractive. Fleeting love-affairs occur.

Intellectual Development

As to the intellectual development there is great intellectual awakening. Many-sided development occurs. Curiosity is at its height. The adolescent may develop a special aptitude for music or language. He may develop mechanical aptitude. He may begin composing poems. He begins to appreciate literature. His vocabulary widens. He enjoys debates and discussions and dramas etc. Urge for self-expression is very great which may result in writing, acting, painting etc.. The adolescent has a desire for responsibility. He also has a tendency to be irresponsible. He is impatient for the results and is very enthusiastic.

D. ADULTHOOD OR MATURITY

1. This is a kind of recapitulation of the later childhood.

2. They become men and women of the world and hard realities of life confront them. "Fantasies fade and reality is faced."

3. There is enough stability in their life.

4. They are objective and extrovert and not emotional and sentimental.

5. A sufficient amount of integration of character and personality takes place and they lead the life of fully grown-up people.

Educational Significance

Our job must be to see ourselves and our children through each stage of development to complete adulthood and our national system of education should be based on clear recognition of these stages of development.

Discovery of these characteristics has a great bearing upon the organization and adjustment of teaching and learning process. It has brought about far-reaching changes in the sphere of education.

1. Firstly, it asserts that education should be child-centered. As the child is not the same being at different levels of ages education, too, should not be same at all age-levels. As children differ from one another as regards their capacities, amount and type of growth and development at a particular age-level, so education of different children should also be different at that stage. Discovery of the characteristics of the stages of development, thus, places the child in the forefront of the educational situation. It helps the teacher much in knowing the educand.

2. Secondly, the knowledge of these characteristics of various stages is very helpful in framing the curriculum and determining the content of education for a particular grade. As the children differ from stage to stage, material to be taught should also differ in character, quality and quantity. What type of material, things, events and facts and how much in quantity should be placed in the curriculum for a group of children and school boys, can be easily determined by the knowledge of various characteristics of the stage of development of those boys. A fundamental principle of curriculum-construction is that it should be based upon the needs, nature and interests of the boys. This principle can be rightly observed only when the teacher has a comprehensive knowledge of various characteristics of different stages. Infant schools cater for children upto seven years of age and base their curriculum and methods on these principles of the stages of development.

3. Thirdly, psychology of the stages of development is of great help in adjusting and devising the best methods of tea-

ching. As the conditions of development are different at different age-levels, so methods of teaching, too, should differ from stage to stage. Story-telling may be very useful at the age of ten years, but it is not very effective at the stage of adulthood. Thus, successful teaching depends upon suitability and adjustment of methods of teaching as determined by physical, mental, emotional and social development of the child at a particular stage. Kindergarten, Montessory and Dalton Plan etc., all are the developments of this very fact. Division of school life into pre-school, elementary education, junior and senior stage is an example of the recognition of the same fact.

4. Fourthly, attention and interests of the children of a particular stage are also determined largely by the characteristics of that stage of development. The teacher should take notice of them and organise his teaching accordingly.

5. Fifthly, stages of development and their characteristics play a very great role in the development of discipline in the children. Discipline is nothing but an orderly and harmonious growth and integration of inner forces and energies at a particular stage in relation to the environmental stimuli. The teacher should know what forces and conditions are dominant at a particular stage of development and should act accordingly so that right type of discipline may result. The infant has no moral code and so there should be few commands at this stage. At other stages also disciplinary activities should be adjusted in the same way.

Rousseau was wise enough to take notice of various stages of human development. He divided the human life into four periods i.e., (1) Infancy from birth to 5 years, (2) Childhood from 5 to 12 years, (3) Boyhood from 12 to 15 years and (4) Youth from 15 to 20 years. He has described in details the various characteristics of each stage and the type of education which should be imparted at that stage.

It is, therefore, not an exaggeration to say that the study of the stages of development should be the basis of all planning of education. In framing time-table, grading children, in compiling text-books, in organizing extra-curricular activities developing character and in giving educational and vocational guidance, due consideration should be made of different characteristics, peculiarities and uniqueness of the stages of development.

The teacher is, thus, greatly benefitted by the discovery of the stages of development and their characteristics.

QUESTIONS

1. What are main characteristics of infancy?
2. Throw light on Emotional, Social and Intellectual development of the child during latency period.
3. What are the dominant reading interests of the boys and girls of 7 to 13 years old?
4. How will you direct and guide the adolescent so that he may develop a balanced personality?
5. "Adolescence is an age of great stress and storm", discuss.
6. What are the chief characteristics of the adolescence?
7. Discuss Emotional, Social and Intellectual development of the adolescence.
8. What is the significance of the characteristics of various stages of development in Education?

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CHAPTER IV

FACTORS OF GROWTH AND DEVELOPMENT

What a child is at a given time is developed from what he was at the beginning and what he has acquired through his reactions. What he may be is potentially present at first and can become actual only after certain phases of his nature have been developed by experience, e.g., a seed has a potential power of producing other seed-leaves, flowers and branches, but not until it has been subjected to heat and moisture and other proper conditions of environment.

So the child must become a human being and must develop in a certain way according to his inner potentialities. Native powers may be dormant unless awakened and stimulated to activity by environment. But nothing wholly foreign to one's nature can be acquired and made a permanent part of one's life.

Thus, these two inner and outer factors are tremendously important in the growth and development of the child. They are known in psychology as Heredity and Environment.

HEREDITY

Heredity covers a number of familiar facts. They all may be summed up in "like tends to beget like", and that children receive mental and physical traits from their parents. Though the germ with which a cat starts life is practically identical with the human germ, yet one develops into a cat and the other into a man. The factor that determines this is termed as Heredity.

How this factor operates and determines the transfer of parental characteristics and to what degree, has been studied experimentally and various theories have been expounded. Important of them are:—

1. Mendel's Law.
2. Continuity of germ-plasm.
3. Evolution Theory.
4. Science of Genetics.

1. MENDEL'S LAW

Mendel was an Austrian botanist who lived from 1822-1884. His hypothesis was published in 1866, but no attention was paid to it until 1900. He made an experiment by crossing the giant peas with dwarf peas for several generations. It was found that in the first hybrid generation all peas were tall, but impure, tallness being the dominant characteristic and dwarfness being the recessive. Secondly, when these tall peas of the hybrid generation were left to self-fertilize, in the next generation talls and dwarfs were produced in the ratio of 3 to 1. Thirdly, when the dwarfs of these generations were allowed to self-fertilize all their subsequent generations were dwarfs (pure recessive character istic). Fourthly, when the talls of the same second generation were allowed to self-fertilize they produced 1/3 pure talls (dominant) having all subsequent generations of the talls and 2/3 impure dominants, having talls and dwarfs in the subsequent generations in the same ratio, while the other one-third of pure recessive having all subsequent generations of dwarfs (recessive).

Thus, he stated his law that some characteristics blend while others do not; secondly, that there is the "segregation of pure gametes."

2. CONTINUITY OF GERM-PLASM

Galton pointed out in 1875 that the child is "as old as the parent", "as old as his remotest ancestor". Thus, according to him the parents are rather the trustee of the germ-plasm than the producer of the child.

Weismann, a German biologist who lived from 1834-1914 adopted this idea and developed it. His theory explains that man comes out of man and not the dog due to this continuity of the germ plasm.

But it does not explain whether the germ plasm that descends from the parent and the organism or the individual who comes out of it are the same.

3. EVOLUTION THEORY

This traces the evolution of life from its earliest beginning to its most elaborate product, and holds that this evolution can be interpreted as the result of small variations in species reacting to material forces and developing according to ancestral law.

The slow but continuous process of evolution has been traced like this:

Sixty million years ago, there were amoebas and jellyfish in the warm waters of the sea. Even before that earliest forms of life were thought to have appeared as "specks of protoplasmic jelly in the scum left by the tides as they receded from the shores of the world's first sea". Then, the earth grew cooler, life left the waters and proliferated into enormous reptile-like creatures such as "dinosaurs" and "gigantosaurs". When it grew still cooler, there appeared birds and mammals. Among them was a lemur-like creature. Its descendents split into two branches, one developing into anthropoid apes and the other into men.

Such was the process which Darwin envisaged. Though many researches have enriched knowledge on this topic since then, yet "modern biology has done little more than dot the 'i's and cross the 't's of his discovery".

This theory is regarded as a great contribution of biology to psychology and education due to its far-reaching consequences. Though there is much dispute as to the manner in which evolution takes place, yet, all agree to the fact that there is an inter-action between the living organism and its environment. However, they also differ in the stress they accord to either factor in the process i.e. the heredity and the environment. Two views are prominent—Lamarckism and Darwinism (better say

Neo-Darwinism). Both recognise the part played by heredity and environment in the development of the child, but differ in the degree of their respective importance.

Lamarckism

Lamarck, a French naturalist living from 1744-1829 stressed the part played by the living organism and its inner hereditary traits and conditions. He held that the organism has an inward urge to satisfy its need and to adapt itself to its environment, and that it changes its natural habits and modifies its bodily structure in doing so. These changes and modifications are, then, handed on to the offsprings who make a further advance in the same direction with the result that a new species gradually emerge after a long time. Such variations as caused by use or disuse of bodily parts when accumulated generation after generation may result into permanent disappearance or appearance of those after a long time e.g., long neck of the giraffe and short tail of the lizzard descended from snake. Lamarckism has two assumptions—the presence of 'horme' the inner urge and a hereditary characteristic within the organism and the other, the transmission of acquired variations to the offspring. The 'horme' is more important in his picture.

Darwinism

Darwin (1809—1882) emphasized the action of the environment on the organism. The environment causes a struggle for life and the survival of the fittest, as a result of which favourable variations occur which are passed on to the next generations e.g., long neck of the giraffe. When asked why should one individual be more fitted than another to survive, Darwin answered "due to innate variations existing between one individual and another". Thus, Darwin's theory has following assumptions:

1. That, environment causes a struggle of life and the survival of the fittest.
2. That, as a result of this, variations occur which are transmitted to further generations.
3. That, in this way natural selection follows.

Darwin recognizes two kinds of innate variations—slight and saltatory, and holds that both are transmissible, though evolution is the result of the accumulation of slight variations.

Mutation Theory

It was published in 1900 by Hugo de Vries of Amsterdam. He recognises only sudden, discontinuous variations of mutation which he considers to be the raw material of evolution.

As regards the transmission of acquired modifications, some believe that they are transmitted, while others, mainly Weismann, oppose this (vide, Weismann's experiment by cutting off the tails of mice for generations and still finding that the young mice persisted in being born with tails). Bernard Shaw said against this that "biological problems are not to be solved by assaults on mice." The most recent opinions are in favour of transmission of acquired traits in some degree and their ability to modify the bodily structure. Instincts are racial habits which have probably been slowly transmitted in this way. McDougall's experiment on pure-bred white rats, put into a tank of water proved the transmission of acquired characteristics. Twenty-third generation made only 25 errors while in the beginning they made 165 errors before learning to go by the dark route.

Acquired modifications of Lamarckian theory are regarded to be different from small innate variations and saltatory mutations.

Thus, theory of evolution explains and shows the importance of heredity.

4. GENETIC VIEW

According to this view, every human being has its beginning in the union of the male germ cell, the sperm with the female germ cell, the ovum. They unite and then divide. Cell division continues and the result is the development and growth. The united germ-cells of the parents also separate and are preserved in the embryo. Thus, the child carries the germ-cell of its own parents, so that the stream of germ cells is continuous from generation to generation.

In the germ cell of father and mother are definite quantities known as chromosomes and genes which unite and determine the characteristics of children. Genes are mysterious beings and elongated bodies that dwell in the chromosomes seen in the fluid of the nucleus of the cell. They are generally invisible and carriers of hereditary tendencies.

The germ cells of parents out of which the child comes, contain chromosomes which are 24 in number. The germ cell of the mother as well as that of the father contains 24 chromosomes. But when they unite together, half of them are dropped and there remain only 24 of them. Each of these chromosomes contains 40 to 100 genes or determiners. At the time of conception, these genes of father pair with the genes of mother, and thus, they determine the qualities of the children. The result of the union of these genes, we call heredity. If from both sides genes of tallness unite, the child is tall. If the father and mother both have weak lungs and so genes of weak lungs, and if they unite together, the offsprings will carry weak lungs and a predisposition to tuberculosis.

This is what heredity means and how it works according to various theories and views. They all prove that heredity is tremendously important a factor in the development of the child. Mendel's law shows that the type of growth and quality of development of the child depend upon the blend of certain characteristics from male and female side and that what the child would be is determined at the time of conception, and not after birth by any education. In the same way, theory of evolution and its "survival of the fittest" may lead one to think that life has no 'higher purpose' to fulfil and education is all useless. Continuity of the germ-plasm and the theory of genes, too, tend to assert the same. When genes are powerful enough to determine the lines of growth and development, how can education be effective. But all such thinking will be erroneous as education and environment, both, are great factors in the development.

SOCIAL HEREDITY OR ENVIRONMENT

Environment provides us with social heredity which is as supreme as biological heredity. Social heredity is the sum-total of all the past achievements. Well-developed traditions, customs, folk-ways, conventions, laws and institutions all help and modify the development of the child. They are given to the child by the social heredity, which is a great environmental force. Social heredity or the environment is definitely an additional way in which the race operates on the individual. Modes of actions are transmitted to us largely by way of social heredity. Other environmental influences such as climate, exercise and nutrition may modify rate and amount of growth. Weismann's theory makes the improvement of the human race almost hopeless, but social heredity, education and improved environment show bright silver linings of racial improvement. The child inherits not only structural changes and biological traits from his parents, but also inherits an environment (social-heredity) in which he is to grow and upon which he is to feed and which,to a very great extent, determines the amount and direction of his development. Thus, all the conditions of life produced by civilization constitute what may be called "social heritage". Man is truly "the heir of all the ages".

The social heritage of an individual consists of all the knowledge, beliefs, customs, laws, language, community, family, art, literature, science and philosophies and so on. Every nation and every family possesses a wealth of beliefs, sentiments, artistic and moral ideas, laws and traditions which descend to the child by way of social heredity. Truly, therefore, in educating a child we should begin with his grand-parents for he will inevitably get the benefit through social heredity.

Thus, social heritage has a conservative force. It binds the present to the past. Just as the biological heredity determines our heredity, structure and our instinctive patterns of action, in the same way social heredity moulds our habits from childhood, determines our social behaviour and then transmits them to the next generation.

Through ever-enlarging social heritage, conditions of environment improve. This results in an improvement in the human race. Improved whole atmosphere with educative toys, a good library, a good collection of pictures, an atmosphere of peace, good behaviour and family affection (superior evironment) may cause better development of children. In the same way wise teachers, improved methods of teaching, improved text-books which are the results of accumulated past experience and social heritage may also add to the development of the child.

Thus, possibilities of education are very great.

EXPERIMENTAL STUDIES

Influence of the factors of heredity and environment on the development of the individual has been studied experimentally.

Heredity

Various methods and techniques have been adopted to study the factor of heredity and its influence upon intelligence. Correlation-method, co-twin-control-method, family-study and foster-children-method are the chief methods.

1. It was discovered that in case of identical twins correlation between their intelligence was .9, in case of fraternal twins it was .6, in case of siblings .5, and in case of parents and their offsprings only .4, and in case of cousins only .25. It proves that intelligence is hereditary, as, higher the degree of blood-relationship greater is the correlation. (2) According to Kallikak-Jukes-Edward-Family studies, out of a family of 496 members established by a normal woman, a soldier had only 5 abnormal offsprings and all others were normal, while, out of 480 of another family established by a feeble-minded woman by the same soldier only 46 were normal. Another study made by Terman proved that out of 62 members of the Hall of Fame 22½% were related to 643 gifted children. Galton's study of 977 men of genius and 977 average men revealed that each set had 535 and 4 eminent relations respectively. (3) According to co-twin-control method one twin received training in stair-climbing, motor skill and another in vocabulary. It was discovered that remarkable likeness persisted in their IQs and mental development. Strayer and Gesell also proved the same. (4) In a foster-children-study Schwesinger took ten pairs of indentical twins, reared them apart from birth and, then, brought together and studied at maturity. It was found that

in 6 pairs there was no difference in intelligence (I.Q), in case of two pairs a difference of twelve points and in case of another two pairs a difference of 15 to 17 points was found.

Environment

Influence of environment on intelligence, too, has been studied experimentally. Wellman's study at the University of Iowa proved that—

1. marked increases in I.Q. were found on repeated tests.
2. children gained during the academic period but failed to gain over the summer months when not in the schools.
3. greatest gains were made by children of the lower levels of I.Q. and
4. Those who attend a greater number of days tended to make greater gains.

It is believed that "within certain limits intelligence is modifiable by environmental conditions."

2 Honzik took 21 to 27 months old children and showed that improved training increases the I. Q. of children.

3. Prof. S.D. Scruggs has also proved that improved education results in an increase of intelligence. Freeman, Flory, Bayley all have discovered the same results. Skodak, Skeels, Asher and Sherman and Keys all have the same opinion. Generally accepted view of school teachers is that I. Q. is largely determined by heredity. But slight variations may occur between 10 to 30 points by improved environmental conditions. Thus, it is fairly possible to predict when the child is six years old as what his position will be when he is 16 years old.

Intelligence may be hereditary. But this much is definite that poor environment may retard the development. So teacher's duty is to provide the best kind of environment to the children. Affection, love, concern etc., have very great influence upon mental development. If I. Q. can not be increased vertically, it may be expanded horizontally. So we can not lose sight of the environment. Even for the gifted high I.Q. proper environment is needed, otherwise it will lie dormant.

RELATIVE IMPORTANCE OF HEREDITY AND ENVIRONMENT IN EDUCATION

A great controversy has appeared in the field of education as regards the influence of heredity and environment on the development of the child. Those who believe in heredity say that heredity is everything and education can not make the child superior if he is born inferior. Neo-Darwinism fails to recognise man's power of taking himself in his own hands. They find man helpless. They believe that man is endowed with reason and will. Intellectual and moral, physical and spiritual powers can not rise above the environmental influences. They fail to recognize that man has limitless and inexplicable powers through which he can win over the environment.

Critics of education believing in the continuity of germplasm speak of the educator's wings clipped off. They say no amount of education can change the individual from what he is or has been in his ancestral beings. So education to them is futile. Really speaking at no point heredity stands diametrically opposed to environment. Heredity, no doubt, plays a very great role in educational theory. But it does not mean that it must be treated as deterministic factor. Though there are philosophers who differ in their emphasis on these two factors, yet there is none who ignores this or that completely.

Behaviorists undoubtedly tend to ignore the factor of heredity. To them environment is all and all. But this is not due to the fact that they do not believe in the heredity at all. This can simply mean that they lay a great stress on environment.

There is no reason, however, to give to one a great value than to the other. The one (heredity) considers man from inside and the other (environment) from outside. Heredity stands for those capabilities which an individual receives from his parents and beyond which his growth can not reach. If we accept this view, education can not make an individual other than what he is.

On the other hand, environmentalists believe that heredity is a disillusionment. Environment makes or mars the man; and, therefore, education through controlled environment can change the man in any way it likes. To the environmentalists education is a great force.

Yet, we cannot accept any of the extreme views. We, as teachers, have to extract truth from both these views. A teacher cannot afford to ignore the environment. But at the same time he cannot hope too much relying upon it.

The teacher cannot know exactly well with what hereditary seeds an individual has born. What he can do is only to provide him with the best opportunities and right kind of environment, in which the child can fully realise his potentialities. The wisdom of the teacher lies in his belief that, though, every human being is born with different capacities, yet, great or small, these potentialities require in order to be actualised constant exercise and certain environmental conditions. Intellectual powers are augmented by the habit of precise reasoning, the study of logic, the use of mathematics, mental discipline and observation of things.

On the otherhand, education will be useless if the teacher assumes beforehand that whatever the training, child's growth cannot surpass his hereditary powers. In order to reach its highest developments, whatever be the gifted traits of an individual, the mind demands an ensemble of conidtions which only the ideal environment can provide. We are almost totally ignorant of the genesis of intelligence, but we have a number of experiences at our disposal which prove that environment bears a real and substantial amount of influence upon the growth of intelligence.

Each one in a certain measure is born good, mediocre or bad. But like intelligence he can develop to his fullest only in a proper type of environment. Moral sense, too, can be developed by education in the same way. Vital forces of external environment react upon the aesthetic and religious senses, will-force and other inner forces of an individual, as a result of which a completely changed and modified individual comes out. From will, intelligence and religion come moral values. No-doubt moral senses like intellectual activity, apparently, depend on certain structural and functional state of the body and the mind. Yet its expression, growth and development take place in a special and right type of environment.

In the same way sense of beauty does not develop spontaneously unaided by environment. It exists in our consciousness in a potential state. But it is only in certain circumstances that it becomes virtual. History of civilization bears a testimony to this. During the history of civilization sense of beauty like moral sense has grown and reached its optimum and has declined and disappeared according to circumstances.

Thus, the powers of the mind remain idle or undeveloped in the absence of education and of an environment bearing the stamp of intellectual, moral, religious and aesthetic accomplishments. Intelligence depends largely on heredity, but without environment its unfolding is not possible. Moral sense, beauty and mysticity are learned only when present in our surroundings as part of our daily life.

The low intellectual and spiritual development of most human beings is due to this inferiority of their psychological atmosphere. The chemical, psychological and physiological factors of the environment favour or hinder the development of the inherent tendencies. Whatever an individual's ancestral tendencies may be, he is started by his environmental conditions upon a road which may lead him either to the solitude of the mountain or to the beauty of the hill. It is certain that hereditary tendencies are profoundly modified by the circumstances that we happen to encounter.

But the influence of the environment upon individualisation (differenciation in the individuals) varies according the states of tissues and consciousness (the inner forces). It is well-known that the response of a given organism to environment depends on its hereditary tendencies. But the part of the environment in the actualisation of the hereditary tendencies of an individual is not exactly known. The properties of his tissues (hereditary factors) and the conditions of their development are inextricably mingled in the formation of the body and the soul of the individual.

According to the laws of heredity given by the science of genetics there are inherent characteristics in each human being. But these (genes) characteristics are nothing but tendencies or potentialities. According to the circumstances and environmental forces these tendencies may or may not become actual. Thus, the quality of an individual and his progress depend both on heredity and on development (environment).

To the Behaviorist, education would be everything and heredity nothing. Genetics on the other hand believes that heredity imposes itself on man like ambient fate and that the salvation of the race lies not in education but in eugenics. Both seem to be blind and fanatics. The genes exercise their influence in the form of the tendencies which become or fail to become effective according to the circumstances of the environment. Certain tendencies of disease etc. are transferred from parents to the children, but simply as tendencies.

Dr. Hayward and other champions also commit a mistake when they say that education is all powerful. They too optimistically ignore the hereditary influences which make themselves felt in the intellectual and moral development of the child. In the same way the extreme view of Galton that "thus far thou shalt go and no further" is not correct. Heredity may rightly step in saying this. But even "thus far", can we go without the cooperation of environment ? If the environment cannot help us in going beyond the limits determined by heredity, at least it gives us enormous assistance within that limit.

Prof. Nunn believing in Lamarckism holds that the principal factor in the process of development is the child himself and that he can make what use he will of his hereditary endowments and his educational opportunities.

QUESTIONS

1. What do you understand by Heredity ? Discuss in brief some of the important theories that explain the functioning of Heredity.

2. Describe Mendel's law of Heredity and explain its significance.
3. Discuss how Genetic View explains inheritance of traits and characteristics.
4. What do you understand by Evolution Theory and what is its significance ?
5. Explain Social Heredity and discuss its importance in the education of the child.
6. Discuss the relative importance of Heredity and Environment in the development and growth of the Child.
7. What place will you assign to Heredity and Environment in educating the child ?
8. Is Intelligence hereditary? Discuss critically giving evidence for and against the issue.
9. Give an account of experimental studies that have been made to know the extent of influence of Heredity and Environment on the growth and development of the child. What should be the attitude of the teacher in the midst of all these intricacies?

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CHAPTER V

MOTIVATION

MEANING AND NATURE

Education is a life-process. Life is a long continuous activity. Every activity has a driving force behind it. This may be called 'Motive-Force' of behavior. To Morgan, 'motive' is a general term which may be used to designate to make a choice to perform an act or to continue in readiness to act in a certain manner. No activity goes without motivation. Donald M. Johnson writes, "the influence of general pattern of activity initiating and directing the behaviour of the organism, goes by the name of motivation." According to Mehran K. Thomson motivation covers any and every factor of the springs of human action from the beginning to the end. Attitude, set, bias, readiness, urge, drive, impulse, appetite craving, incentive, want, desire, wish, interest, aim, purpose, intention, longing, will, determination, etc. any one may become a motive. Thus, motive is that state of organism which makes it perform certain act or duty. The organism goes into action under some form of inner pressure. The inner pressure which may be of various types is termed as motivation. Thus. motivation is that force which compells one to act, to behave in a particular direction. It explains the "why" of a human action and behaviour. It answers the question why a person behaved in a particular way; why he was angry, why he stole, why he did a certain thing. It is the internal impetus of our behavior which may be in the form of needs or drives. The direction that such a motivated behaviour takes is the goal. It is also conceived as the force that energizes the behaviour and directs learning.

Motivation has two components—the need and the goal. The goal reduces or eliminates the tension. Through experience motives are attached to specific goals. Then, they become motive incentive conditions.

Incentives are, thus, related to motives. They are an aspect of motives. They are the goal conditions or situations which the child through his experiences has realised and which, he knows, will satisfy his internal motivating conditions.

Morgan holds that the source of motivation is the urge to avoid mal-adjustment. Such an urge has been called a "drive". Woodworth uses the term "drive" broadly to mean the stimuli which arouse the individual to activity. Dashiell uses it in a narrower sense and believes that it is "an original source of energy that activates the human organism" or that "sets it going". Motivation, as distinguished by Brooks, refers to the "lines" or "directions" along which the organism proceeds once it is set going.

Some distinguish between motives and incentives. They hold that motive refers to the subjective striving and incentive to the objective appeal. Truly speaking motive includes all sorts of stimuli, internal and external. "Drives" are used to refer to only the organic strivings. i.e. internal pressures.

Psychologists have tried to describe the source, the ultimate cause of motivation. Various accounts have been given such as the "will-to live", "inherent impulse of self-preservation", "a chain of reflexive acts", "the logic of the situation", "a kind of tropism", "environmental forces acting on an organism", "a will, a desire for pleasure and avoidance of pain", "an emotion", "instinct", "reason", "ideas", "feeling", "the libido", "the subconscious mind" and so on. But, pleasure-pain-principle is the most comprehensive explanation. Motivational force may flow out of any one of them.

A 'drive' may be defined as the state of persistent disequilibrium which leads to an increase of general activity. Motivation in the form of a drive results in some sort of tension within the organism. To this tension, the child makes certain specific reactions to get relief. A 'drive', thus, has three elements:

(a) A vague tension that excites the child to act.

(b) An expectation of relief by performing a particular act.

(c) That, it comes from within.

CLASSIFICATION

It is difficult to classify motives. However, Mehran K. Thomson classifies them into two categories— natural and artificial. By natural motivation he means important mechanisms or native motivational units. By artificial motivation he means outer forces and factors that work as incentives. Forces of natural motivation are utilized in artificial motivation. This makes it clear that 'drives' can not be identified with motivation. To Dashiell 'drive' is an "original unlearned behaviour". Thus, only native motivational units come under the 'drive'. Incentive is chiefly a matter of acquired human nature. Some classify motives as (1) primary or impelling which cover all "inner drives" and (2) secondary or directing.

A. PRIMARY MOTIVATION

Most important of these are:—

1. Biological motives or animal drives or autonomic acts and reflexes.
2. Instinctive drives.
3. Emotional drives and its derivations such as sentiments, attitudes etc..
4. Social motives.
5. Personal or Ego-motive.

1. *Biological Drives*

When the controlling factors are chemical and neural conditions within the body they are called biological motives e.g., hunger, thirst and sex. Besides these there are other self-regulatory mechanisms and reflexes within the body which account for a large share of animal and human activity. They include respiration, heart-beat, flow of blood, digestive process, glandular secretion etc.. A knowledge of these mechanisms can tell the teacher much about his pupils. They help him in explaining their activities. All biological drives are inherited. A very large segment of modern business organization is given over to satisfying the biological motives of the people. During warfare, economic depression and when civilization breaks down animal drives reassert their dominance.

2. *Instinctive Drives*

Instincts are innate tendencies or mechanisms to react according to the logic of the situation. They are strong drives and acting in line with them is satisfying to the organism and that the thwarting of these is annoying. Hence they are of great importance in education; and a greater possibility of education lies in them. "Nature has given us that much of a start in educational motivation." A teacher's duty is to provide the child with the best setting for the functioning of these mechanisms.

3. *Emotional Drives*

Like biological motives, emotions, too, organize behaviour in certain general patterns. An emotion stirs up a sudden outburst of rather stereo-typed activity in reaction to a prominent stimulus. Biological motives are cyclical, emotions are episodic. Biological motives originate with the body, but emotions are touched off by environmental events. Anything can acquire emotional significance as a result of one's experience and most of our emotional patterns are learned. But generally man has inherited his emotional reactions from his primitive ancestors. Emotional drives, too, are of great importance in education. Moods and anxiety are also mild forms of emotional patterns. They are persistent effects of certain emotions. They, too, are very important for the educator.

4. *Social Motives*

Social motives originate in social inter-action. Instinctive and emotional drives are modified by special pressure and the human being becomes a sociable animal seeking the company of others and sensitive to their disapproval. It has various forms as given below:

1. The tendency to seek the company of other people, the instinct of gregariousness, is a primary social motive. It is very strong in all living beings.
2. The tendency to seek social approval and avoid social disapproval is another social motive.
3. Self-assertion or mastery motive is another tremendously strong social motive. This impulse to make oneself the master of the environment, to overcome obstacles is present in all of us. We like objects, persons and situations which make us feel "big" and significant. Conversely we dislike those who make us feel "small". Showing of excessive desire for attention, jealousy, rivalry, ingratitude can be explained in terms of self-assertion, status and prestige. The desire for prestige is one of the strongest motive because it is based on the social impulse. Craving for recognition, power, leadership and success is the result of prestige and status motive.

5. *Personal or Ego-motive*

A threat to the ego increases general activity like other motives. It acts like a stabilizer holding the individual to the course that his concept of himself sets for him. Ego-motive is highly personal.

Other primary motives are aesthetic desire for knowledge, competition, loyalty, ideals and purposes and hero-worship. Ideals and values are regarded to be the highest forms of social drives.

B. ARTIFICIAL MOTIVATION

Learning and motivation both are inseparably related. If motivation affects learning, learning also affects motivation. Motives are modified as a result of learning. Such modified motives are attached to different goals or stimuli. These stimuli become learned motives or secondary motives. They are merely reinforcing conditions of motives. Reward is such a learned motive It is a condition that reinforces activity and takes the form of effective motive. Thus, learned motives or secondary motives are nothing but "externalization of drives". They are secondary reinforcements. Rats have been experimentally led to learn a completely new maze on the basis of secondary reinforcement. Through imitation, learning by conditioning and suggestion human beings acquire a number of secondary motives.

Knowledge of results, law of effect, interest, manipulation of environment, punishment, rewards, working for self, rivalry and competition, cooperation, participation, enlisting the whole personality are artificial motives which work as incentives.

Rewards and punishments play a very great role in the motivation of school work.

Punishment is based on the natural motive of fear. Arousal of this motive destroys initiative and develops in children an inferiority complex. Punishment is a negative motive and is therefore inhibitory, not creative and expansive.

Reward is a positive motive. It calls forth initiative, energy competition, self-expression and some creative ability. It appeals to ego, and pleasure is experienced. Reward may be material, social or spiritual. It may be praise, promotion, badges, election to office esteem, honorary degree.

Participation is a strong incentive. So all education should be through participation. It means giving the child a voice as well as a place in the social as well as in the school life. The Project Method is the best method to encourage participation. Enlisting the whole personality is the climax of motivation. Appealing to two or more motives is much more effective. It is the whole personality that must be satisfied and not any one impulse.

Artificial motives can be effective only when they are tied in with the natural urges and drives in school work.

WORKING OF MOTIVES

Following are the ways in which the fate of the motives is determined:

1. They may be realized or inhibited.
2. They may be disjuncted. It means partial realization of motives.
3. They may be disguised. The disguise takes place through rationalization, compensation and overcompensation.
4. They may be reinforced. It is a sort of mobilization of motives when the opposition is from without and which is the result of a challenge to whole personality.
5. The final possibilities are of substitution. Other motives may be substituted for the original ones.

Life is a long continuous activity in the line of satisfying wants and needs. But it is a very hazardous affair, not a routine job. People do not always get what they want. Thus, there are two main ways in which functoining of motives, drives and wants may result:

1. *Frustration*

When a motive force or a drive or some want activates an individual towards some goal and then something interferes with his progress with the result that satisfaction is not achieved, we say that the person is frustrated. Thus, frustration is the failure of a motivation activity.

2. *Conflict*

When two or more motives act in different directions we say that the individual is in the grip of a conflict of motives.

Frustration sometimes results in aggression and sometimes in indifference to life and its activities. Conflict retards the progress.

MOTIVES AND INCENTIVES IN SCHOOLS

School is a place for learning fundamentals of knowledge as well as fundamentals of human behavior such as certain good habits, manners, desirable sentiments, attitudes and mental dispositions. Such a learning is more effective when organised in proper conditions which include effective motives and incentives. When the outward conditions or situations have greater motive values i.e. persuation to learn, learning is more efficient.

Such motives and incentives develop out of four basic human motives. They are:

(a) Physiological drives such as hunger, thirst, need for rest or sleep, sex, emotional states, escape from pain, elimination etc..

(b) General strivings for "self-actualization" in which need is felt to use energies and capacities in various activities.

(c) Learned social motives such as need for attention, company, liking, need for love and affection, seeking for other's approval, avoiding blame, security, mastery, progress, success etc.

(d) Learned individual interests, ideals and purposes.

Out of these four develop numerous school motives and incentives. It is difficult to list them all. However, a list is given below for guidance of the teachers:

1. Acquisition of knowledge, understanding and skill which satisfy the *interest* of the children

2. Use of acquired knowledge, such as, using acquired skill in writing a letter, a book etc..

3. Mastery over a challenging situation such as solving a difficult problem.

4. Consciousness of progress.

5. Curiosity.

6. Love and affection of the teacher.

7. Praise or approval by the teacher.

8. Blame or criticism of the student's work and mistakes.
9. Competitive spirit.
10. Sympathy of teachers towards students.
11. Feelings of security about one's status in regard to achievement, promotion, social relationships.
12. Threat of insecurity such as not being promoted, being disliked, not being able to compete.
13. Punishment.

All of these motives and incentives are not worth appreciating. Threats and punishments, because of their harmful and inhibiting influences on personality development are being abandoned. They are effective no doubt; but they produce often mental conflicts and other maladjustments of personality. Briggs and Elsbee have recorded enough data in this regard. Elsbee has observed that every child desires success, recognition, sympathy and affection and dislikes punishment with all its various forms.

Appeals to competition have been experimentally found to intensify learning effort. They increase efficiency of work and facilitate learning. Praise and approval motivate effort toward achievement more effectively and also promote more healthy social and emotional adjustment. This has been affirmed by Hurlock's experimental study.

In the same way successful experiences have great motivating forces. Lantz has concluded on the basis of experimental work that they raise the average score on a mental test. Knowledge of progress and interests too increase efficiency of work and level of learning.

Thus, motivation is an essential condition of learning. The more appropriate is the motivation, the more efficient will be the learning. Children need to feel secure, loved, approved and successful. These findings should be properly utilized by the teachers in the classroom.

EDUCATIONAL SIGNIFICANCE

Motivation is very significant in all phases of education and learning. Education is not teaching but enabling the child to learn for himself. It's success depends, therefore, upon appeals, incentives, impression, encouragement and all those forces that set the child ready to learn. In other words the problem of education is the problem of motivating the child.

In the words of M.K. Thomson, "motivation is the art of stimulating interest in the pupil where there is no such interest, or where it is, as yet, unfelt by the pupil, and also of cultivating the interest already present on behalf of the stated curriculum." Thus, motivation gives rise to interest and interest is short-cut to all learning.

A well-motivated pupil is highly attentive; he takes to his work wholeheartedly and achieves maximum success in the activity.

Problem of discipline is ultimately a problem of rightly motivating the child in the desired channels.

Formation of character and building up a right type of personality depend upon right type of guidance in motivation. If high ideals and virtues of life are substituted as driving forces, lifting up of the personality on to a higher plane becomes a simple job.

All methods of teaching go waste without motivating the child. They become effective only when the child is well motivated.

Thus, psychology of motivation is of great value for the teacher. How a teacher should proceed with motivation is described by M.K. Thomson. He gives the following few points:

1. The teacher should utilize force of a master motive.
2. He should encourage participation.
3. He should appeal to as many motives as possible.
4. He should enlist the whole personality.

5. The teacher should be enthusiastic. Enthusiasm is contagious.
6. He should make special use of the gregarious impulse and the desire for status.
7. He should set the proper example. What you are will speak more eloquently than what you say.
8. Motives have goals. The more clearly the goal is perceived, the more strongly the act is motivated. Every effort to make the goal more vivid and vital is a step in the direction of effective motivation.
9. He should furnish opportunity for self-expression in as many ways as possible.

Individual differences in motivation are due to age, heredity and learning process.

QUESTIONS

1. What do you understand by Motivation? What is their source?
2. Discuss the true nature of motivation and their functioning.
3. What are most important motives that may find a place in the school?
4. Classify motives and discuss each in details.
5. What is the significance of motivation in Education?

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CHAPTER VI

INSTINCTS AND EMOTIONS

Every living organism is born with 'Horme', an inner urge to act. This urge to act is not random. Man's activities and behaviour are more definite and precise and they have got a definite system. Every human-being acts in particular directions. Even the baby has definite impulses. Thus, the inner urge to act has certain specific modes of expression. In other words every human-being is born with the 'Horme' already differentiated and specialized. These specific modes of behaviour are explained by psychologists in terms of special terminology as instincts.

MEANING AND NATURE

Different Psychologists have defined instincts in different ways.

1. McDougall defines instincts as "certain specific innate modes of behaviour in certain specific situations which do not have to be learnt and which are common to all members of the species."

2. To others they are 'innate mental dispositions', 'innate engram complexes'.

3. Some hold that instinct is an innate impulse towards certain modes of behaviour.

4. Thus, it is just the innate mental structure taken as a whole in its Hormic and Mnemic aspects e.g., the cry of a baby, a situation of danger in which we seek safety instinctively.

5. C.W. Vallentine in his book *Psychology and its Bearing on Education*, writes "an instinct is an innate impulse to act in a certain way fulfilling some biological purpose. It is

an innate mechanism for efficient acting which is not dependent upon experience."

For example, had there not been the instinct of escape and fear the man would not have escaped the lion and lost life, making various irrelevent and spasmodic actions.

6. Prof. Nunn holds that they are merely phases of "will to live".

7. According to behaviourist psychologists instinct is a piece of complex neural and muscular machinery acting in a manner determined by its structure when stimulated by the stimulus. According to Watson an instinct is "a combination of explicit responses unfolding serially under appropriate stimulation."

Thorndike conceives of them as "native movements in the nature of many specific responses to various differing situations each of which is to be studied separately."

CHIEF CHARACTERISTICS

Thus, following are the main characteristics of instincts and their activities:

1. They are innate, not acquired.
2. They are common to all living organisms.
3. They are expressed in particular directions according to particular stimuli.
4. They are "goal-pointed" or "goal-directed". It means that they have definite ends to be realised.
5. They are plastic and modifiable. The native endowments, instincts of the child at birth are only possibilities and become realities in lesser or greater degree according to environmental conditions. Just as potatoes and pumpkins may be produced in the same soil, so persons differing greatly in character may develop in the same community or in the same house.
6. They are the main springs of human action.

7. Their functioning is dependent upon age, physiological conditions and environmental conditions; and due to their presence-absence, normality-abnormality, differences in individuals appear. Variations in health conditions modify instinctive development. In the same way conditions of environment also effect the development of instincts e.g., swimming instinct does not appear in ducks without actual contact with the presence of water. Again, age-factor is also important e.g., instinct of sex, fighting, playing, feeding etc., develop only at a certain age level.

Instinct is also related to physical structure. A change in physical structure may result in some change in instinctive response e.g., birds do not show flying instinct unless the wings develop, nor the nesting instinct, unless ready to produce young; before their teeth & claws are developed young lion avoid rather than attack large animals.

8. Intelligence and experience act as guide to the instinctive action, but instinctive impulse is always stronger than the forces of intelligence and experience. It is true that instincts are blind. But when two tendencies are aroused "the eye of conscious intelligence is opened to choose in the light of past experience the most favourable reaction."

9. Various accounts of instincts imply that they exist within the organism as separate items, but they work together and make a single whole self of the individual. As a machine is built of wheels, so the self of the individual is built up of instincts. Psychologists insist that the organism is prior and comes before the instincts. To them instincts are simply special modes of self-assertion that have developed and become somewhat permanent channels of behaviour in the course of its racial history. The reason for this seems to be perhaps the persistent utility to the individual and the race.

CLASSIFICATION OF INSTINCTS

The first and the foremost basis of classification should be the usefulness subserved by various instincts. To a considerable extent all animals have the same general needs. Hence, a classification based on the ends or purposes served by the instincts will apply to all forms of animal life including man.

Based on this, instincts may be classified under following heads:

1. Individualistic or self-preservative instincts, the primary end of which is the good of the individual. These are Fear, Fighting and Feeding.

2. To live as species, animals must have instincts to produce and care for young generation. These are called racial instincts. They include caring, mating and parental instincts.

3. Those instincts which impel animals to act primarily for the good of the group or the species as a whole have been named as social or gregarious instincts.

4. All animals come in the world in an unfinished state and can not survive without adapting to their own environment. They need urges that can impel them to adapt to their surroundings. These are called adaptive instincts, under which come play, imitation and curiosity.

5. Every species of animals that is to survive must conform to the laws of nature and environment (society or group in which they live). Hence, a tendency to act according to natural and social laws must have developed. This is known as regulative instinct which includes moral instincts and religious instincts. Besides, there are instincts of construction, acquisition, self-assertion and aesthetic instincts.

From the stand-point of importance and number of instincts there are various classifications and accounts given by various psychologists.

1. McDougall gives a scheme of 14 important instincts which are Appeal, Acquisition, Curiosity, Combat, Construction, Sex, Submission, Self-assertion, Parental, Escape, Repulsion, Laughter, Food and Gregarious instinct.

McDougall defines an instinct as a "mental structure which is inherited and which compels the individual to perform certain specific actions in certain specific situations." Though, he takes notice of cognitive and conative aspects of instinct, affective aspect is the central point in his theory. Unique feature of his account is his belief that every instinct is accompanied by a particualr emotion which is the "central, essential and unchanging aspect of instinct". He gives a list of 14 parallel emotions also. A very comprehensive account given by him runs as an instinct is "an innate disposition which determines the organism to perceive any object of a certain class and to experience in its presence a certain emotional excitement and an impulse to action which finds expression in a specific mode of behaviour in relation to that object."

Freud recognises only one instinct which is the instinct of sex. According to him "human behaviour reduces to the manifold expression of impulses of very few ultimate types among which the impulses of the sex-instinct fill a very large place."

Some psychologists recognised as many as 40 instincts.

This difference in the number of instincts is due to the respective importance, the psychologists assume of various general and specific inner urges, the branches of the tree of the Horme.

From another point of view instincts have been classified as fixed or indefinite. Instincts that are perfect at birth and unchanging throughout thousands of generations of the species are called fixed instincts. Instincts that are so imperfect at birth and so variable in form that they can scarcely be distinguished from voluntary acts developed by individual experience are called indefinite instincts. Fixed instincts are more prominent in lower animals.

Instincts are also classified as continuous, transient and periodic. Some instincts like fear and feeding are present at birth and last all through life. They are called continuous. Instincts not present at birth, but appear afterwards and continue to be manifested all through life or nearly so, though usually in a diminished degree are called transient. Some instincts appear at regular intervals as at the migrating season or caring for the young are in a certain degree rhythmic or periodic.

The teacher has to determine the time at which each instinct is most prominent and then to apply the right stimuli at the right time so as to produce the most perfect and rapid development along desirable lines.

ORDER OF DEVELOPMENT

Young animals do not show the mating, migrating and nest building instinct, nor adults have the same degree of playfulness as the younger ones. There are three considerations which explain the order of development of instincts:

1. They appear in order in which they have been acquired in the history of the race from the lowest forms up.

2. These instincts which have been more universally useful to all species rather than the oldest should be the strongest and should come first.

3. Different instincts are needed at different stages of development and this has determined their order of development.

IMPORTANCE IN EDUCATION

Man is descended from the same ancestry as the animals, but he is different from them. He has won in the struggle for mastery on this planet because of the possession of powers which others lack. Man's superiority lies in the greater plasticity of his instincts. It is due to this plasticity of instincts that development of higher life is possible. So instincts are of great value in education.

Instincts are prime-movers of all human activities. The self has got an inner urge to express itself. Education is to guide the expression of this urge in the desirable channel. All the force that this self commands has been derived from instincts. Hence each instinct has a force behind it which compels the individual to act in a certain way. Knowledge of this fact can help the teacher in analysing the behaviour and activities of his pupils. Instincts are the moving forces of human behaviour. They are the forces that always try to go out and find out satisfaction. But their natural ways of satisfaction may or may not be desirable. The task of the educator is to work with these instincts which are the bricks out of which the individual's character is fashioned. The educator meets them in their crude form and his great task is to transform and purify them. Man is not slave to these instincts. In higher forms of life instincts must work in the service of reason and intelligence. Control and guidance of instincts in such a way may lead the evolution of life from its crudest form to more and more refined one which is the fundamental responsibility of the teacher.

Instincts play a great role in the activity of learning. Growth in learning is from what already exists. Nothing can grow out of nothing. It begins in the modification of instinctive acts and each new state of learning is the outgrowth of previous acquirements. Learning is the process of modifying the instinctive actions in becoming adapted to the special environment affecting the organism. In the same way training and teaching of a child is a process of modifying instinctive and habitual reactions and developing new ones in association with them in such a way as to produce coordinated movement and thinking.

Besides,, various problems of education can be easily solved with the help of the knowledge of instincts and their functioning. Every teacher has to face the problem of discipline daily in his class. Knowledge of instincts which are great motivating forces can help much in this task of the teacher. For mischiefs inattention, undesirable behaviour, disregard for the teacher etc. there must be some instinctive force responsible on the part of the boys. The teacher must find the root cause and remove it. In young children instinct of self-assertion may be responsible for various activities of indiscipline. Main tendency in them is to draw attention of the teacher towards himself by raising hands and waving them, making noise, talking in-between, moving chairs, telling a lie and so on. Children's stealing and theft may also be explained in terms of instinct of acquisition or self-assertion. Lying may be sometimes due to the driving force of self-preservation e.g., the boy lies to save himself if asked whether he has broken the plate or the boy tells a lie that his father has Rolls Royace car while actually he has only the old Ford.

Their emergence or presence gives a speciality to each stage of development which is very essential from the teacher's point of view, because it helps in adjusting the teaching to a particular age-level, rendering teaching more effective and lasting.

They carry a very great influence upon the methods and process of teaching as well as curriculum construction. Activity method, learning by doing, playway and project method have come out as a result of the consideration of these instincts.

Instincts determine a very large share of the interest of the pupils. This may help the teachers in compiling text books for their students at various age-levels and selecting suitable material to be taught.

Most of the instincts are creative and therein lies the possibility of creative education, educion that develops in children a sense of creation and delight.

Thus, instincts are the fixed notes of music out of which numerous desired melodies can be spun. They are the fixed keys, which, if properly tapped can bring about the desired result.

Education is a social process. It is wedded to the social and moral uplift of the individual, that is, modification of the child's behaviour. The teacher, therefore, ought to know what the fundamental bases of behaviour are. Psychologists have listed two main forms of them—innate and acquired. Major portion of the innate basis of behaviour is covered by the instincts.

HOW TO DEAL WITH THEM

Finally, the teacher should know how to deal with instincts and how to control and guide them so that maximum good may result out of them.

Instincts are the natural valleys down which the water of child's natural energy flows. In animals these valleys and channels are more fixed and hardly changeable, but in man they may be diverted, modified, completely eliminated and re-enforced and co-ordinated by the self and social training.

In the opinion of Thorndike education should encourage some instinctive responses, eliminate others and redirect a few ones. Thus, there can be three possible ways of controlling instincts.

(a) Complete elimination or inhibition or repression.
(b) Redirection or modification or sublimation.
(c) Encouraging or re-enforcing some instincts.

Repression

The psycho-analysts stress upon redirection or sublimation and reject elimination or repression as it is dangerous. Repression or elimination is like building a wall across the valley without making any provision for the piled-up waters being drained away. In such a case three things may happen:

(a) A burst of the dam which may do more harm than the unrestrained river would have done. But it does not mean that we should release the floodgates from time to time.

"Sowing wild oats is not the best way of preventing the evils of repression."

(b) Water behind the wall may seep through in secret places to create new problems worst than those for which we built the wall; for example, if we wall-off sex instinct for life, it leaks out in preversions or transfers itself to unhealthy friendships and favouritisms.

(c) Our dam may be a success. The valley below may be quite dry absorbing the whole energy. The restraining of that imprisoned force neutralizes whatever force the individual possesses. A tremendous mental conflict is set up in such a case, which is all the more disastrous because it is unknown to the conscious mind. Repression is not identical with self-restraint. Self-restraint includes conscious repression, too, which is not harmful.

Sublimation

Second method of dealing with the instincts is redirection, modification or sublimation of instincts. It means redirecting an instinct from its primitive biological goal to one that is socially and individually uplifting. All success is sublimated curiosity. Fear of bodily pains may be sublimated to the fear of wrong which hurts the soul. The whole task of education is therefore, to sublimate the instincts.

This conception of sublimation was fathered by Freud. He defines it as "unconscious deflection of "libido" into others, more socially acceptable channels". Libido, according to him means the energy of the sex instinct, and sublimation of sex instinct means redirecting the energy of the sex impulse. This may be possible through appreciation of beautiful pictures, love of art and poetry etc..

Sublimation is widely held to be the solution of many problems of adolescents which are given rise to by the emergence of a new instinct, the instinct of sex.

This is a method of reducing tension which may be achieved by cultivating a wide variety of interest. In short, it means deflection of an impulse from its original natural outlet on to a higher moral level or socially permissible plane. Its truth is well expressed by the proverb "satan finds some mischief for idle hands to do", so let the child be absorbed in some other activities which are harmless and socially desirable and which flow from a particular instinct.

Two accounts try to explain how sublimation takes place:

1. Firstly, there is Freud's view which says that it is the identical elements that make sublimation possible e.g., enjoyment aroused by poetry, art, music and also the sex object have common elements and so sublimation is possible.

2. Secondly, there is Burt's view that assumes that there are two factors of emotional energy—one the general factor and the other specific and group factors which correspond to various instincts. Sublimation is possible due to this E, the general factor. But the deflection of specific factor is doubtful.

Encouraging and Re-enforcing Instinct

Some instincts are useful even in their natural ways of satisfaction. Such instincts should be encouraged and strengthened. Instinct of construction, moral impulses and other regulating instincts should always be re-enforced.

INNATE CO-ORDINATION OF INSTINCTS

Instinctive tendencies have their own innate system of grouping and co-ordination. Burt's inquiry reveals that:

(a) Firstly, there is a general factor of emotionality which enters into all functions of native tendencies. That is why some are very emotional by birth.

(b) Secondly, there are two groups of instinctive tendencies, strong or "sthenic" and weak or inhibitive or "asthenic". Strong group includes self-assertion, anger, sex and curiosity. The weak set includes submission, parental-fear, sorrow and repulsion.

(c) Thirdly, there are specific factors for each independent tendency. The individual may reveal a high specific tendency towards one or the other. One may be lacking in general factor but may reveal a high specific factor. The teacher should discover this and then adopt a process of controlling and redirecting instincts accordingly. Highly emotional children should be treated with great mildness, sympathy and love. This sensitiveness is to be respected at all costs. Less emotional ones require much greater provocation and stimulation.

EMOTIONS

Like instincts emotions, too, are very important forces in the education and development of the child.

MEANING

According to Ross, emotions are "modes of being conscious in which the feeling element is predominant". In other words these are certain "well-defined states of consciousness" or the "feeling-tone of a particular quality", the "affective colouring of the experience".

Arthur Gersield defines emotion as "a state of being moved and stirred up or aroused in one way or the other."

It involves feelings and impulses and physical and physiological reactions.

They are supposed to be "complex affective mental state which pre-suppose a pre-existing conative disposition."

C.W. Vallentine holds that "when feelings become intense we have emotions."

To McDougall, emotions are "central, essential and unchanging affective aspect of instinct."

Dr. C.S. Myers wrote to Prof. Nunn in his letter, "I look upon emotions fundamentally a pre-cognitive response to a situation, a-priori thalamic reaction, and the instinct as the root of all this."

THEIR CHARACTERISTICS

1. They are adjustments which favour the execution of instinctive activity, e.g., in a state of fear body prepares for swift locomotion, in anger for successful combat and in case of creative impulses for creation.

2. During emotional excitement the muscles responsible for involuntary movements become very active. That is why behaviour is sometimes uncontrolable.

3. They have a conative disposition i.e. an urge to activity.

4. They have a tendency to persist in the forms of moods and anxiety. Anxiety is some kind of persisting fear.

5. They may be aroused either by stimulus outside (perception of objects) or by organic changes (alcohol or by intoxicating). For the same reason temper changes with our changing states of health.

6. The same emotion may be aroused by a large variety of stimuli e.g., love for a subject may be aroused by various

stimuli, method of teaching, inspiration from the teacher, its content and so on.

7. They hinder the voluntary movements and behaviour.

BODILY CHANGES IN EMOTIONAL EXCITEMENT

An emotional excitement is followed by changes in the blood produced by shortage of food and water or by the secretion of the glands. These chemical substances orient the preceptual apparatus toward appropriate objects or goals and prepare the motor apparatus for certain actions. The internal changes are mainly hereditary and the goal-directed activity has a trial and error character and is modified by practice.

These internal changes accompanied by emotional excitement are controlled by a sympathetic nervous system which is a small set of nerves and their connections outside the central nervous system. It is independent and autonomous. When it begins to work with an emotional excitement nerve-fibres going to the heart are innervated and the heart-rate increases. Other fibres go to the adrenal glands forcing them to discharge adrenalin into the blood stream which raises blood-pressure, aids in the coagulation of the blood, forces the liver to give up stored-up sugar into the blood stream and speeds up the kidney's elimination of waste product. This sympathetic nervous system is not entirely autonomous. It is influenced by nerve centres in the brain, especially by the thalamus at the base of the brain. It has been discovered that removal of the thalamus produces considerable changes in emotional reactions. Thus, the whole pattern of emotions can be summarised in the following sequence.

The stimulus or the situation is perceived in the light of past experience through sense organs. The reactions reach the brain by way of the thalamus. Nervous impulses from the thalamus go down the spinal cord and out to the sympathetic nervous system, causing various internal changes. Nerves also go to the skeletal muscles from the thalamus touching off the running or fighting and facial tension.

CLASSIFICATION OF EMOTIONS

1. Watson recognises three important emotions which are Fear, Rage and Love.

2. Gates and others recognise six important emotions which are Anger, Fear, Excitement, Pity and Sex.

3. McDougall gives a list of 14 emotions which are Distress, Ownership, Wonder, Anger, Creativeness, Negative Self-feeling, Lust, Love, Fear, Disgust, Amusement, Gusto and Loneliness. According to him every instinct is accompanied by a particular emotion. So parallel to 14 instincts there are 14 emotions. He maintains that emotion is an inevitable companion of the instinct. This theory has been criticised by Dr. River, Drever and Brown. Dr. River says emotions are not "central, essential and unchanging aspect" , but they come upon the level only when an instinctive energy is not allowed to run out smoothly.

IMPORTANCE IN EDUCATION

1. Emotions are of great value for the teacher. Out of emotional appeals develop sentiments, ideals, purposes and interests. They relieve of the monotony of a highly perfect machine, making life uninteresting and a dead affair. A teacher, therefore, can achieve greater success in his work by arousing emotions of the children. Without emotional appeal the lesson can not be interesting and an uninteresting lesson will remain ineffective. Thus, emotions are a good medium of arousing interest in the school work.

2. Sometimes, they make greater achievements possible. When emotionally excited, children can do extra-ordinary things. The teacher should utilize this fact in school work.

3. Strong emotions may help to break up some other crude and undesirable emotions.

4. They give a quality to personality and form its emotional basis. Temperaments of the pupils are largely controlled by the degree of emotionality and adjust his teaching and behaviour accordingly.

5. Emotions are strong motivating forces of actions. The

teacher should arouse right type of emotions in children, preparing subjective conditions of the pupils for the learning.

6. Taste regarding things, desirable values, virtues and subjects of learning is possible to be cultivated through emotional training and their proper stimulation and control. Transfer value of the teaching depends upon successful emotional appeal.

7. The finest flower of character which is the fundamental aim of education is the product of fine growth of emotions. The teacher should begin well with the emotions in order to achieve success in this direction.

CONTROL OF EMOTIONS

If emotions are of so great a value, it becomes imperative that they should be guided properly to achieve the desired goals. Control of emotions is needed for:

(1) Integration and development of personality.
(2) To ensure full and proper development of the child.
(3) To avoid mental conflicts.
(4) To remove dis-satisfaction and unhappiness.
(5) To build up character and ensure higher evolution of life.

HOW TO CONTROL

Following are the chief ways of controlling emotions :

1. By keeping good health.
2. By avoiding highly exciting events and situations.
3. By change of environment.
4. By allowing expression of emotions in desirable channels.
5. By method of disuse which means absence of a stimulus continuously for a long time.
6. By repeating the stimulus again and again.
7. By putting the individual in the society.

8. By conditioning, substitution and sublimation.

9. By rationalising the situation.

Repression of emotion is harmful and so should be avoided as far as possible. Controlling of emotions does not mean inhibition or refusing them to be released. If the emotional energy is completely blocked, the psychic re-vibrations will continue which may produce personality-disturbances. The children, therefore, should be put more and more on their own responsibility and self-direction. The teacher should not interfere too much. Moreover emotions give zest and spice to life and add important qualities to personality.

QUESTIONS

1. Discuss the Psychological nature of Instincts and give their chief characteristics.
2. "All possibility of education lies in the plasticity of Instincts", discuss.
3. What are various ways of dealing with Instincts and Emotions in Education?
4. Discuss "Repression" and "Sublimation" in Education.
5. Define sublimation and discuss its role in the education of the child. How will you make use of it?
6. What do you understand by Emotion? What are their chief characteristics?
7. Give the classification of Instincts and enumerate the most important Instincts.
8. What steps will you take for controlling the emotions of the school-children?
9. Why is the control of emotions necessary?
10. "Instincts and Emotions are the raw-material with which character and personality are built", discuss.

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CHAPTER VII

SOME IMPORTANT INSTINCTS AND TENDENCIES

Let us now study in details some important instincts and tendencies. Most important of them from teacher's point of view are:

1. Instinct of Curiosity.
2. Instinct of Construction.
3. Tendency of Sympathy.
4. Tendency of Play.
5. Suggestion.
6. Imitation.

INSTINCT OF CURIOSITY

MEANING AND CHARACTERISTICS

From the very beginning curiosity in some form is daily and hourly present as a factor in human action, thought and learning. It may be described as an "appetite for new experiences". Feelings of wonder and novelty are associated with the instinct of curiosity. These feelings and impulses prepare subjective conditions in the school boys which compel them to make inquiries and to know more and more about a thing. Thus, following are the main characteristics of this tendency:

1. It gives rise to interest, desire to know and a feeling of joy, which happen to be strong motive-force for all work and learning.

2. Curiosity, if aroused properly, evokes in children, good subjective conditions of attention which are neccessary for every sort of learning. Intense attention and high degree of concentration of mind which often result in fine creations come out of curiosity.

3. When curiosity is aroused there happens to be a sort of identification of the child's personality with the situation and the activity, and learning becomes "a whole-hearted purposeful act".

RESULTS

Curiosity works as a good motivation in school education. Following are the chief results which a teacher can achieve through proper appeal to this instinct:

1. Efficient and effective learning.
2. More permanent and enduring results.
3. The students may get a new insight to solve the problem.
4. Creative insight is born in children.
5. Self-education, which is highly valued in new education, becomes possible.

6. The child is brought into intimate relation with various phases of his environment instead of simply those that minister to his experience. Every thing around him is made a part of himself. Greater knowledge of environment is gained through curiosity, with the result that there is greater possibility of adaptation to environment. It lays up greater ores of knowledge which serve as a basis for useful reactions. Necessity is a great teacher, but curiosity is still a greater teacher because even in early infancy it gives lessons which prepare for life. The race as well as the individual have learned through curiosity. In its highest form curiosity has led to many scientific discoveries.

ITS KINDS

Curiosity is of two kinds—Empirical and Speculative. Early in life and whenever a new object is introduced, the kind of curiosity excited by the mere fact of newness may be called empirical. Later the same object excites curiosity not because of the new sensation but because of the desire to trace the relation of some of its characteristics to those of other objects. The curiosity, thus excited may be called speculative.

HOW TO DEAL WITH

Following suggestions are worth considering in this regard:

1. Material to be taught should be very interesting. An interesting lesson will stimulate the subjective conditions and curiosity will come out.

2. The element of novelty should be retained all through the lesson and it should also have certain degree of intensity to be effective.

3. The problem should be created in the beginning at the stage of introduction. This will create curiosity in children. In the course of the lesson curiosity may be aroused by putting questions, giving oral examples and reciting thrilling events etc..

4. The whole situation in which learning has to take place should be made vivid, attractive and curiosity-provoking.

5. Direct-telling should be avoided as far as possible.

6. Child's previous experience, his needs and desires and urges at that stage of development should also be taken into account.

7. In the early years of life, Empirical curiosity should be the aim of the teacher, while in upper classes Speculative or Relational curiosity should be given more importance. A habit of scientific enquiry develops through Speculative curiosity.

8. Curiosity is modified by every new instinct that emerges at a stage. The teacher should use her skill in associating studies with the natural growth and development of the child.

9. Heuristic method, Project method and problem-solving go a long way in arousing curiosity.

10. Teacher's personality should be asserting and his way of telling things should be indirect and thought-provoking. Thus, if properly handled curiosity alone is a sufficient motive for the invasion of every fresh field of knowledge.

INSTINCT OF CONSTRUCTION

MEANING AND CHARACTERISTICS

It is a tendency to create. It is an outgrowth of that form or racial instinct which causes suitable places to be prepared for the shelter and protection of the young. In animals it is manifested into activities that are useful to the species. In men, it is independnt of any end to be gained. There is a peculiar pleasure accompanying constructive activities, perhaps, because one feels and perceives in concrete form the evidence of his power to do, to modify and to change.

2. Things created supply a very great pleasure and satisfy the self of the individual. In further learning, this provides a strong motive to the child.

3. The destructive tendency is probably only a modified form of the construction, for it gives the same evidence of the power to change. It is more often attracting to children, because destructive changes can be produced more quickly and easily than constructive ones.

4. Constructive instinct is also associated with other instincts and motives.

5. Imitation and suggestion are the natural stimuli to this impulse. Like other forms of play it needs to be spontaneous and free. Too much guidance and direction often inhibit the impulse.

6. This tendency is very strong in the early years of life.

RESULTS

The teacher may get following results through an appeal to this instinct.

1. Creative insight or creative genius may develop in children.

2. In the early years it helps in the development of the

co-ordination of sensory and motor organs and the unity of the body and the mind.

3. It makes "learning by doing" effective.
4. Maximum attention can be achieved in the activity.
5. It develops in children originality and imagination.

How to Handle with

1. Ask the boys to do things for themselves e.g., to draw charts and maps, to collect pictures, to do clay modelling, metal work, ceramics and other work.

2. It should be at the option of the boys to select any of these activities. All can not be equally interested in the same activity.

3. The teacher should not interfere much as it may kill originality and initiative.

4. The teacher should not discourage the students even if they do something wrong. Children should be allowed to utilize their whole fund of energy, while the teacher should simply guide and supervise.

5. Formalism should be avoided.

6. The teacher himself should have a faith in and devotion to the activity taken up by the boys.

SYMPATHY

Meaning and Characteristics

Sympathy means "feeling with" —not only feeling with but also feeling to do something. It is a reflex imitation. The child reflects emotional expressions of others and as a result feels somewhat as they do, e.g., crying in terror with others and laughing with glee with others.

Real sympathy appears only when the child not only feels somewhat as others do, but consciously represents them as having feelings like his own. This likely occurs in the third year. When the idea is once developed, it is likely to be extended to animals, flowers, sticks and stones. The young child does not clearly distinguish himself from other things. Hence his mental states are readily projected into them. He thinks of other things as feeling as he does. Hence all nature seems to rejoice or weep with him. When a thing in which he is interested is injured, he also feels the injury. So he is the most sympathetic being. He is identified with every thing that he knows.

As he gets a little older and the individualistic instinct takes the lead, he rarely feels an impulse to take suffering in place of another. He hardly feels for others.

Sympathy is described by Ross as "the affective side of the gregarious instinct". McDougall holds that instincts are capable of being unlocked by the perception of their functioning in others, e.g., "smile evokes smile, fear evokes fear". This he names as primitive sympathy or instinctual sympathy.

The basis of child's sympathy is his own experience. So he is indifferent to the deepest joys and sorrows of the adults.

KINDS

Two different forms of sympathy have been distinguished—passive sympathy and active sympathy. In passive sympathy conation is lacking. Only the sympathetic induction of emotion is found to be present. In the active sympathy there is an active urge to do something, e.g., parental and protective impulses arouse active symapthy. If we see grief portrayed on the screen in the cinema hall we tend to feel a similar emotion. The inner experience here is limited only to the feeling aspect. This is passive sympathy. When this inner experience compels the individual to do something, sympathy becomes active.

IMPORTANCE IN EDUCATION

1. Sympathy has a very great persuasive power. It is only through sympathy that a teacher can make the boys carry out

his commands. Thus, arousal of sympathy prepares subjective conditions for order, obedience and discipline.

Sympathy is also essential for permanent discipline or real discipline which means discipline of natural tendencies governed by higher sentiments, virtues and higher values. Sentiments about higher values and virtues can be formed only when they are suggested through sympathy. Thus, formation of character and development of right type of sentiments also depend largely upon sympathy.

2. Sympathy removes the distance between the teacher and the taught with the result that the boys begin to love the teacher and all his commands. Teaching becomes therefore effective. Students can not learn from a teacher who is rude, rough and dry and who is not liked by them.

In order to arouse sympathy one must excite the child's imagination so that he may put himself in the place of the desired object, the sufferer. Sympathy, therefore, depends not only upon experience but also upon imagination.

Sympathy is very strong motive for inculcating in children a sense of respect towards the teacher and his activities.

PLAY

Play is a very strong tendency. Every child plays. Even adults like to play.

ITS MEANING

The impulse to play is just "the impulse to carry out certain instinctive actions". (Thomson)

According to Prof. Nunn it is a "profound manifestation of creative activities".

Play is an activity which is taken for its own sake.

According to Prof. Vallentine "play is a kind of amusement in the work". But amusement is a milder and passive form of play. Someone else does the work, while the seeker of the pleasure enjoys it.

Some define play by drawing a distinction between play and work. They say that play is an activity which is taken for its own sake. To them the essence of play lies in the fact that the enjoyment of activity is its only end, for example, the child makes sand-huts only to knock them down and build again. Here the activity of construction and destruction has no purpose other than itself. The child can stop this at his own will. In work, the activity is imposed upon the individual by unavoidable necessity and the individual is held to it by a sense of duty or vocation.

According to Kirkpatrick, objectively the results of playful activity are usually of little lasting importance while work usually has results more or less valuable and permanent. Subjectively, an act is playful only when it is not only enjoyable but is directed chiefly to the securing of pleasure. Play is comparatively free while the work is some necessity. Physiclogically work is much more harder and wearisome, while in play parts of the body are freely active without exertion.

According to Prof. Nunn two factors distinguish between play and work :

1. Conditions imposed upon the agent, and
2. Spontaneity.

An agent thinks of his activity as play if he can take it up and lay it down at his choice. He thinks of it as work if he is bound to it by certain conditions, duties, responsibilities and purposes. In play, therefore, spontaneity rules almost unchecked. In work the activity is obstructed by constraining conditions. Some hold that playful activity is not for its own sake but with a serious end in view. But, they forget that even the serious goal itself is taken without external constraint or economic necessity. It is taken because it is required to stimulate and guide activities which are enjoyed for their own sake.

Play is also distinguished from games. Games are intermediate between free play and work, because they involve more or less direction of activity according to rules.

THEORIES OF PLAY

Why should a child play ? This has been explained by different psychologists in different ways. There are four main theories:

1. *Recapitulation Theory of Stanley Hall*

It means recapitulation of certain activities of the primitive man. Hide-and-seek, chasing, hunting, fishing, stone-throwing building of houses all remind us strongly of the youth of the race.

2. *Surplus Energy Theory of Schiller and Herbert Spencer*

It says that the play is an expression of surplus energy.

3. *Anticipation Theory of Karl Groos*

According to this theory, play is an anticipation of the future needs of the animal. Thus play is of great biological utility. It is a great adaptive tendency.

4. *Catharsis Theory*

It holds that the child plays because "it provides an outlet for certain pent-up instincts and emotions which cannot find expression".

No theory is perfectly true but each of them contains some truth. Whatever be the fact, this much is definite that tendency of play is very strong and is found in all children and that it has a great adaptive value.

DEVELOPMENT OF PLAY TENDENCY

The first play of children are wholly free; that is, children follow no rules. Upto first two years, the child resents to all sorts of directions. During next three or four years customs which serve the purpose of rules may be established through imitation. Upto entering the school, the child is ready for games with very simple rules, but he loses his interest in games with many rules.

During the flirst five years the childs' activities are free. From five to ten years games become more and more prominent and after twelve years plays other than dramatic have wholly given place to games and sports.

Play becomes less free with age.

The great lesson of law as a means of freedom is no where taught so well as in well-directed and orderly play. In play the child fully realises the value of law. The teacher through these orderly games can successfully prepare children for good citizenship, forming public sentiments for order, law, fairness etc..

POWERS USED IN PLAY

For two or three years child's play is almost wholly sensory, motor and perceptual. But mental powers are also used in the perception of likeness and differences.

In the third year the representative powers are developed. Soon, merely all his play is transferred to the field of imagination where freedom is complete.

Imagination which is a director of playful movements usually approaches its climax in the fifth or the sixth year. Fairy-tales are interesting at this stage because they give joyful excercise to the imagination. As the child grows older exercise of physical power becomes less important.

From six to twelve thought power is used to some extent. To some the thought activity involved in such subjects as Mathematics may be as enjoyable as play.

Thus, all powers physical and mental are exercised and tested and perfected in play.

INSTINCTS INVOLVED

Perhaps the earliest instinct expressed in play is that form of curiosity which delights in change.

The feeling of personal power in effecting changes is an important element in play.

Instinct of imitation is very prominent in plays from three to seven. Imitative and dramatic plays are very popular at this stage.

Competitive instinct is very prominent in plays from seven to twelve. It continues to be prominent all through life, but is often subordinated by the social instinct after puberty.

IMPORTANCE IN EDUCATION

All the theories of play and its psychological nature go to assert that it is a strong natural tendency found in all children at all levels of age. It therefore, becomes necessary that it should be properly used in education. There is nothing striking, therefore, if we say that the whole of education should be conducted in the spirit of play, as this will lead to joyful spontaneous and creative activity. The educators hoped that education through this tendency could bring about good results in education. As a result of this hope, there appeared a new device in teaching, "the playway in education". In his book the "Playway" Mr. Caldwell Cook has confirmed that education should follow this method. Indeed, this is one of the best formula which sums up the modern spirit in education. It is a universal method which can be applied to all children in all subjects.

According to Sir John Adams "Playway is the result of the 'paidocentric tendency' in education", which means process of education viewed purely from the point of view of the child. This tendency, too is the product of the natural tendency to play.

Playway has many advantages in education.

1. Firstly, through this method education becomes very effective and efficient.

2. Through this the child gets an opportunity for the satisfaction, sublimation and redirection of his various instincts.

3. Creative impulses of the child get a chance to develop. The most vigorous and the most typical expression of creative and original nature of man are found in play.

4. The child enjoys maximum freedom which is the life-breath of children's activities.

The child develops originality, power of reasoning, imagination and insight.

5. Education through playway is self-education. The child himself is his teacher, a fact which is very important in education.

Tagore said "the child is like a bud and the bud must open for itself."

6. Playway is a device of teaching which breaks down in schools the old anti-thesis between play and work, eliminates drudgery and supplies with a joyful spontaneous spirit of play to all learning activities.

7. It generates in the boys an attitude of absorption, a keenness as manifested in hobbies.

8. It creates interest in the activities of learning.

9. Children are encouraged to experiment and explore the truth.

10. All school exercises in which repetition to secure skill and accuracy is necessary including word-drill, numbers, requiring rapidity in fundamental operations, factoring, etc., and fixing facts of geography, history and grammar, may be conducted as games and playful activities rather than as formal drills.

All these advantages are of great value in teaching and learning. Thus playway is of very high significance in education. Its contributions to the methods of teaching are very great. Playway attaches very great importance to the child, leaving all cards in his hands.

SUGGESTIONS FOR TEACHERS

In planning educational games for young children, the muscular, perceptive and imaginative powers must be called into action and tested. When children are a little older reasoning ability may be exercised, and imagination and memory tested.

As children grow still older the tests may be made more difficult and complex, resulting finally in tests of various powers combined, including thought power.

The rhythmic, imitative and dramatic instincts may be chiefly appealed to in the younger children; then from seven to twelve, the competitive instincts, and from ten years on, the cooperative, class or group spirit.

The chief points to be recognised are that the drill should be neither too difficult nor too easy, that there should be some element in it that appeals to the children and the variety should be introduced in order that there may be no fatigue or loss of interest.

Care must be taken that the child learns to enjoy and appreciate work and to engage in it when necessary. If the child feels keenly the necessity, usefulness or beauty of a task and believes that he can perform it, he will enjoy doing it, although parts of it may be unpleasant. The play impulse may need one, to desire, to achieve and along with it should be cultivated an appreciation for things that are worthy of achievement.

This will combine in the most happy way the play and the work impulses.

ITS MANIFESTATIONS IN EDUCATION

An adequate account of playway can never ignore the forms into which it has shaped in education. Out of the belief in the utility of this tendency various new methods and systems of teaching have emerged in education. They are :

1. Montessory Method.
2. Dalton Plan.
3. Kindergarten.
4. Project Method.
5. Homer Lane's "little common wealth".
6. Norman McMunn's teaching through partnership.

7. Dramatic Methods.
8. Boy Scouts and Girls Guide.
9. Make-Believe Plays, fairy-tales and child fantasy.

There can be no limit to such devices. It all depends upon the wisdom of the teacher how to utilize the play tendency in education.

SUGGESTION

MEANING AND CHARACTERISTICS

Suggestion has been used in various senses. It means stimulating some idea in the mind of another person e.g., the book may stimulate thinking in the line laid down by the author or its content.

In a more unimpeachable way suggestion has been defined by Charles Fox as "the intrusion of an idea into the mind, met with more or less opposition by the person, accepted uncritically at last and realized unreflectively, almost mechanically".

The best exposition has been made by Dr. River who defines it as "a comprehensive term for the whole process whenever one mind acts on another unwittingly". Suggestion is the process by which we accept ideas from others without having adequate grounds for their acceptance e.g., belief in printed things, belief in advertisements. Thus, suggestion is passing of an idea from something on to another person unconsciously. Its main characteristics are ;

1. Suggestion is a matter of assertion rather than arguments e.g., a cry of fear asserts not argues that the danger is at hand.

2. Suggested belief gathers round itself whole mass of confirmatory evidences. This fact has two reasons

(a) we tend to remember what fits in with our own beliefs and forget that does not.

(b) we tend to perceive what agrees with our own wishes and beliefs e.g., capitalists can not be suggested by a communistic philosophy.

3. Strongly independent people are hard to be suggested. They may sometimes get contra-suggestion. The only way to influence such people is to allow them to believe that they have had the idea themselves. A pupil may form the low opinion of the capacity of his teacher and in this case he can not be made to learn from him. Some have so strong and independent spirit that they are practically unteachable.

SOURCES OF SUGGESTION

There are two main sources of suggestion.

(a) Things and objects.

(b) People.

In the first case suggestion is called form-suggestion. In the second case it is called prestige suggestion. Prestige-suggestion is of two kinds :

(a) Personal suggestion.
(b) Herd Suggestion.

ITS KINDS

Suggestion is mainly of two kinds.

(a) Auto-Suggestion—when suggestion comes from within the self. Here the source of idea suggested is one's own self.

(b) Contra-Suggestion—It is the opposed thinking or thinking in the reversed direction.

CONDITIONS OF SUGGESTION

For successful suggestion following conditions are necessary:

1. Ignorance,

2. A "set" or "state of readiness or expectation".

3. Subjective conditions such as interest, purpose, sentiments and ideals etc.. These determine to a very great extent the success in being suggested.

4. Weakness of will power and lack of integration of character and personality.

5. Superior authority. We are more suggestible if the suggestion comes from superior authority.

6. Suggestion works more successfully when it is associated with love and sympathy and reverence for the person who suggests.

7. Young age.

ITS IMPORTANCE IN EDUCATION

Suggestion is of great importance in education. Really speaking much of education is mere suggestion.

1. Dr. Keatinge has given three principles which must underlie all teaching—demonstration, heurism and suggestion. He holds that in all teaching which is to be effective suggestion must be given its due place.

2. Charles Fox maintains that while moral training may be an incidental product, the most suggestive moral instruction in school is that, which is absorbed constantly and unconsciously from the general atmosphere and the teacher's personality. The 'ethos' (tone) of the school founded on aspirations, traditions, its own history is essential as it suggests certain ideals and virtues to the children. Thus, suggestion is important for character-development and moral training.

3. Suggestion is the basis of ideal discipline, better citizenship and good life. Public sentiments can easily be developed by way of suggestion.

4. A teacher not only teaches a particular subject, but he also teaches intellectual alertness, faithfulness and love of work. It means concomitant learning is also very important, which means development of certain habits and attitudes. But success in this, for a teacher, depends largely upon his cleverness in suggesting such ideas to his pupils.

SUGGESTIONS FOR THE TEACHER

1. The teacher should take into consideration all the characteristics and conditions of suggestion and should act accordingly.

2. The past should be kept alive through memorials, records, old boys' clubs as they suggest to the pupils a sense of continuity.

3. Extra-Curricular activities such as dramas, excursions etc. have a very great suggestive value and they should be included in the school activities.

4. Separate rooms for geography, history and science etc. should be provided as they are very suggestive. They should be regularly and properly maintained.

5. Nothing should be suggested which is inconsistent with the youth's dominant tendencies as it arouses contra-suggestion.

6. Affection and love are the bases of effective suggestion. We want to be in accord with those whom we love. The teacher should arouse love in children for suggesting virtues and good sentiments to them.

7. Children are more suggestible. Their actions are more due to suggestion. The younger the age, the greater the possibility of suggestion. A teacher of the primary and infant classes, therefore, should make more and better use of suggestion. But it should not be neglected even beyond that. Suggestion of ideas can be more easily attained by the use of suggestive questions. But the result depends upon the form of questions, for example, showing a picture if we ask "is there any dog?" nothing can be suggested. But if we ask, "how many dogs are there?", we can definitely suggest that there are dogs.

8. Prof. Vallentine gives desirable qualities of the teacher, capable of suggesting. They are :

(a) Friendliness combined with the impression of superiority having some reserve and self-control.

(b) Some degree of mysteriousness which leaves the child with certain wonder.

(c) A vivid interest in and feeling for the ideal which he is setting forth.

(d) Sufficient knowledge and general culture to command the respect of his pupils.

Only such a teacher can spell charm upon the pupils and can make them ready for suggestion.

9. Suggestion should be positive and not negative. When we tell a child not to be disobedient, our suggestion is negative.

10. False mass propaganda should not take the place of thought by way of suggestion.

IMITATION

MEANING

1. Prof. Vallentine says that when suggestion is made by action rather than by an idea it is well to use the term imitation.

2. Ross defines it as the conative part of gregarious instinct.

3. Imitation is a tendency to copy others. But it is the copy of only actions.

4. McDougall says "it is an innate tendency", while Thorndike says "it is not innate but a result of satisfyingness of the activity".

5. Psychological basis of Imitation is the general tendency for the perception of image of an action and produce a similar action.

KINDS

It has two kinds:—

A. 1. Deliberate or purposive.
   2. Primary or Unconscious or involuntary.

B. McDougall gives five types of Imitation:
   1. When actions are sympathetically excited in others it is called sympathetic imitation.
   2. Ideo-motor actions are sometimes imitated automatically. This is called Ideo-motor Imitation.

3. Deliberate imitation.
4. Between the second and the third there is a fourth kind of imitation. This may be called image-imitation.
5. Imitation of very young children.

C. Drever classifies into two classes:

1. Unconscious and
2. Deliberate.

D. Kirkpatrick in his book *Fundamentals of Child Study* classified imitation under following heads :

(*a*) *Reflex Imitation*

This is largely sensory and is shown when a child is caused to do something for which he has a physiological tendency to do. Yawning, crying, laughing, reproduced by children in the first half year are of this class.

This is the only form of imitation until the second half of the first year. Later, it is obscured but remains all through life. It is for this reason that good and bad humour, politeness, rudeness, carefulness and carelessness are all catching. All persons especially children are like mirrors reflecting back, what they observe, responding smiles with smiles and irritable with similar words and actions.

(*b*) *Spontaneous Imitation*

Nothing in his environment escapes the child. He absorbs and makes it all a part of himself by reproducing. When the child reproduces an act not provided for by other instincts without any purpose, other than the unconscious one spontaneous imitation appears. Imitation of the whistle of a locomotive is a kind of spontaneous imitation. For three or four years this form of instinct is dominant.

It is very prominent in the latter part of the first year. Reflex imitation is often combined with it. It is not analytic and synthetic. It is always of wholes, large or small. By this, the child makes the world his own and obtains control of it. Nothing is imitated that does not attract the attention. Attention is determined by inner subjective conditions. So stages of development play important role in spontaneous imitation.

(*c*) *Dramatic Imitation*

In this, things heard or read as well as those observed are imitated, but the reproductions are not literal. They are transformed into various ways by the imagination of the child and made to aid in the representations. This is closely allied to spontaneous imitation but differs from it in this that the child now finds his own mode of reproducing. In this also there is no purpose outside the act itself.

At three years of age appears contrary suggestion. Dramatic Imitation greatly increases the possibility of varied development. It begins in the third year and continues all through life. But it is at its climax from four to seven years This is the tendency as represented by substitution.

(*d*) *Voluntary Imitation*

This is the same as Deliberate Imitation. It is always more or less analytic and synthetic, attention being directed to the parts of the process and to the order of combination or synthesis. Memory images are the guide in this. Act of writing, pronouncing a word are the acts of voluntary Imitation. Voluntary Imitation appears in the second or the third years, but does not become prominent for several years. Its success depends upon the mode of performance.

(*e*) *Idealistic Imitation*

This is an attempt to act according to a copy or standard conceived as correct and desirable. It leads to, and is guided by concepts adopted as ideals. Social, aesthetic, moral, religious ideals are naturally formed and imitated, not from a study of their verbal expression, but as shown in concrete acts and objects.

Idealistic Imitation begins in the third or the fourth year. It is largely a matter of training till the teens are reached.

Imitation might very frequently be substituted for direction and rules. With younger children imitation should be largely spontaneous, while with older ones it should be voluntary; and with still older children it should be followed by analysis leading to specific directions and rules.

IMPORTANCE IN EDUCATION

1. Imitation plays a very great part in the early development of the child. A young child learns all his actions and movements by imitation. Development of language takes place through imitation. Manners and good behaviours are also learnt by way of imitation.

2. Good habits, right sentiments and useful traditions can be easily imitated by the children if they are actually lived in the school environment; and thus the child may be put on the track of self-realisation and character-formation.

So the teacher and the school environment should be made perfect models, for many things they are composed of may be imitated by the children.

DEVELOPMENT OF SELF

(*Ego or Individualistic Instinct*)

At first this instinct is, like all other instincts, blind. All the child's early movements are for his own well-being. Hence, the ideas, emotions and volitions that develop from these movements are concerned with obtaining desirable things for self, though he has no clear idea of self. In the 2nd and 3rd years, when the adaptive instincts are prominent, action becomes less individualistic. The child does and feels as others around him and sometimes seems equally well pleased.

In the 4th and 5th year, when the child has become more self-conscious, he looks ahead to the favourable or unfavourable results of actions. He tries to get all good things for himself. Reflex-sympathy and the desire for approval influence his motives and actions to a considerable extent, but often he tends to choose consciously that which will bring pleasure to himself, regardless of how it will affect others. Sometimes, he wishes both, to gratify selfish impules and to secure social approval.

By example and special training the social instinct of sympathy and desire for approbation may be made dominant. Punishement is not very effective at this stage.

The child is the centre of universe and every thing and every body is for his pleasure. Persons and things are valued in proportion to the amount of satisfaction he can get from them.

The first few years of school-life are prominently a period of selfishness or individualism. The child's chief motive in life is to get every thing possible for himself.

LOVE OF APPROBATION

1. This instinct is very strong in young children.

2. Even before a child can talk, he seems to be affected by words of approval or disapproval. At first he cares more for the approval of parents, later, of teachers and then of companions.

3. At puberty his ambitions are stirred and he wishes for the approval not of merely individuals but for that of the world also. In other words he wishes to make a name and become famous.

4. In the middle of life most men care more for thier reputation than for their personal needs and individualistic desires.

5. So strong is this instinct that what we wear, eat, read and do are largely determined by it. This impulse never dies out even in the breast of the most hardened criminals.

6. Children, thus, often become what their teachers believe them to be and many a baby has been saved by the faith reposed in him by the teachers, parent or the friend. So the educator should always see the good in his pupils. No one who has not a large faith in humanity and in the possibilities for good in every boy and girl should ever enter the school-room as a teacher.

7. Approval of companions (of social group as a whole) gains in influence with advancing years. It means that the

child comes to have more and more regard for the public sentiments. So in the school public sentiments expressed in taunts are more powerful than the words or even the blows of the parent or the teacher.

8. In the early years parents and primary school teachers, through their love may get them to do almost anything by appealing to the desire for personal approval. But as they grow older, they care more for public sentiments. So the successful good teachers must learn to understand, mould and ease public sentiments in governing her school. While the high school teacher must do the same, he may also rely upon the general principles of conduct, accepted by the world.

QUESTIONS

1. Give the psychological nature of curiosity and suggest some ways of dealing with it in the schools.
2. Describe chief characteristics of the Instinct of Curiosity and mention what benefits the teacher can derive out of it in teaching.
3. What are various kinds of curiosity and how curiosity can be evoked in school-children?
4. Discuss the role of Instinct of Construction in the education of the child and mention how a teacher should proceed to deal with it so as to derive maximum benefit.
5. What do you understand by sympathy? What is its importance in Education?
6. Describe various kinds of sympathy and show how they can be made use of in the education of the pupils.
7. Give the psychological nature of Play. Distinguish between Work and Play.
8. What do you understand by "Playway" in Education? In what way this tendency has influenced the process of Education?
9. "Why does a child play?" What explanations of this are available in Psychology?
10. How the tendency of Play is being utilized in Education? What results a teacher can get out of this?
11. What do you understand by suggestion? What is its importance in Education?
12. What are various kinds of suggestion and under what conditions suggestion can be most effective?
13. Describe psychological nature of Imitation and discuss its importance in Education.
14. What are different kinds of Imitation and what use of them can be made in Education?

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CHAPTER VIII

ACQUIRED BASES OF BEHAVIOUR

Instincts and other natural tendencies are the innate bases of human conduct and behaviour. But as growth and development proceed on, these native mechanisms are modified as a result of the reaction of the environmental conditions upon them. The total result is that the individual acquires certain new dispositions and changed mental states which ultimately become the real controllers of the behaviour and human activity. These dispositions organize themselves into certain systems; and these systems, again, organize into one larger system. These are respectively known as sentiments and character.

SENTIMENTS

MEANING

Sentiment is a more or less permanent disposition built up through experience. It is a mental state to feel various emotions, according to varying circumstances in relation to a person or thing; for example, sentiment of love, describes a whole attitude or disposition. Feeling of joy in presence, sadness in absence, fear in danger, anger and so forth all may be experienced by way of the sentiment of love. Thus, sentiment is a blend of feelings and emotions. But sentiment is not a single state of feeling. It is a system of feelings i.e., a system of emotions, appetites and desires organized with reference to a particular object and having a considerable degree of stability e.g., smoking. The basis of smoking is a group of bodily appetites. Thus sentiment is the resultant of a few spasmodic impulses and appetites organized round an instinct. The sentiment of hate is a system of feelings of pleasure, displeasure, relief, regret, hope and disappointment etc.. Sentiment of respect is a blend of self-submission, wonder and admiration.

Certain objects, persons or ideas become the centre of a definitely organised group of emotions and such group is called a sentiment. If we have a sentiment for a thing we tend to feel more strongly for it than for other objects. Sentiments seem to grow deeper and to change in character with experience. They are the products of emotional experiences of things, ideas and persons.

Sentiments are the results of smooth integration of mental structure. "It is an organised system of emotional tendencies centred round some object." It is the "sum-total of an individual's feelings and emotions for an object, thing or an idea".

According to McDougall sentiment is "an enduring, conative attitude towards some object induced by experience of that object."

CHARACTERISTICS

Following are the main characteristics of sentiments :

1. Sentiments are acquired characteristics. They are not innate like instincts. They are the results of growth, development and experience and they also change with experience.

2. A sentiment is a system of feelings and emotions which includes all the affective phases.

3. Feelings and emotions organise round about some object, person or idea.

4. They control human behaviour and form acquired bases of character and personality.

FORMATION

In the formation of sentiments following two factors are involved :

(a) Intellectual comprehension of the object.

(b) Organisation of emotion or emotions and feelings round that object.

Sentiments are formed at the ideational level and not at the perceptual level. Three levels of integration have been distinguished separately on the cognitive side. They are perceptual, ideational and rational. On the affective side they are emotional, formation of sentiments and ideals or purposes.

Sentiments about objects and persons are easy to be formed. But sentiments about ideas and values are difficult to be formed.

A kind of negative sentiment can be formed due to unpleasant feelings attached to a particular object. We call these negative sentiments as antipathies.

IMPORTANCE IN EDUCATION

Sentiments are the units of mental and emotional organisations and they remain comparatively stable. Therefore, they become stable and strong motive-forces of human behaviour. A teacher can make use of this fact in education. By administering to the pupils right and appropriate stimuli, he can develop in children sentiments, forces which may compel the pupils and enable the teacher to achieve success in various fields of education, in the field of learning, discipline, formation of character and personality.

Education is a process by which a compromise between the needs of the children is established. Success in this line can be achieved by forming right social sentiments on the part of the pupils.

Civic sense, patriotism, righteousness, love for humanity, feelings of brotherlihood, consciousness of rights and regard for duty, all are social and moral sentiments. Unless the teacher is able to develop certain sentiments about these virtues and values these qualities can not be acquired by the pupils. Hence progress of society can not be furthered. Success of democracy depends upon such an education. Sentiments formed about ideas, ideals and virtues are of high value in moral life. We must have a strong emotional urge to act upto an ideal or in the line of virtue, otherwise society will some day be torn to pieces and humanity will go to dogs. If we have a tendency to feel strongly, to care greatly for certain ideals we shall be more likely to act in accordance with them.

The teacher should try to form sentiments about desirable things and he should develop in children antipathies about undesirable actions.

Moral character depends mainly on the sentiments formed, for they provide the individual with normal reactions to situations and emotional force which urge to act according to his ideals. Moral code of every country and of every age has been a result of certain dominant sentiments prevailing in these countries and in that age. If we are to change the morals of a nation, we must set ourselves to build up the sentiments most influential in affecting the conduct we desire. Such sentiments should be listed out first and then means of forming them should be chalked out. Schools are the best and very effective agencies of education, a great force for this end.

Besides moral training a teacher should also build in childrens' minds strong sentiments for school-subjects and school traditions. This may help him in establishing discipline and raising up the tone of the school environment.

Through the teaching of literature, recitation of poetry, art and painting, social-service-leagues and excursions etc., we give rise to the formation of various desirable sentiments.

Peace, harmony and happiness in the life of the individual as well as in the life of a nation depend upon formation of proper sentiments in the children and its youths; and to a great extent the burden of this falls on the shoulders of the teachers.

SELF-REGARDING SENTIMENT

Building up of various sentiments no doubt produces some unity in conduct, but does not solve the problem of co-ordinating tendencies and impulses. A man's whole-self may include a number of sentiments and, yet there may be conflicts between them. How this conflict, then, should be washed off and unity and co-ordination should be achieved becomes an important problem. To solve this one requires some greater sentiment for self, the master sentiment.

Energy of instinctive and emotional life flows along the direction given to it by the set of one's own self. The growth of the self may be described as "a process in which the impulses that have their roots in instincts and appetites become organized into a permanent hormic system, wielding imperial authority within the organism, or as the building up of a great engram complex around the instincts and appetites and the dispositions to knowledge and actions which belong to and derive their energy from them" (Nunn). Self-complex must be thought of not statically but dynamically. "It is expressed in a unified system of thought, feeling and action. But it is constantly modified by the result of its own activity and constantly becomes a more coherent definitely shaped structure" (Nunn).

According to Prof. A.F. Shand self is largely built up of certain massive, sub-complexes of a typical character whose activities are sentiments.

According to Sturt and Oakden self-regarding sentiment is the most important of all sentiments, the formation of which is dependent on the self-consciousness which, according to him, develops in the following way :

(a) First, the child distinguishes himself from his surroundings, between himself and other persons, between animate and inanimate things.

(b) Then, he develops reflection and self-criticism as a result of social interaction.

(c) Finally, two aspects develop:

1. He becomes and acts as a thinking being,

2. Cosciousness of self as an object of his thought and experience develops.

Now his own self becomes an object round which he develops a sentiment. Therefore, perhaps, the self-sentiment is the first sentiment that the child forms and all other sentiments formed in his later life derive force from this master sentiment.

Thus, the process of formation of this sentiment is just the same as that of other sentiments. The same two factors are involved here also :

(a) The intellectual comprehension i.e. consciousness of the self and

(b) The generation of an emotion of self-regard.

But the formation of this sentiment is slow and prolonged and requires a proper environment during the whole period of an individual's emotional development.

ITS IMPORTANCE

1. A strong self-sentiment is the basis of all other desirable schemes of sentiments. Self-sentiment controls our all other sentiments that form the ground-bases of the self. A man gifted by nature and smiled on by fortune may build up a self into which the love of the body, of family and friends, of riches, of intellectual and spiritual things makes a unified and nicely balanced whole.

2. Self-sentiment is the basis of character and all morals. To bring about a reformation in character it is necessary to re-establish a person's self-respect.

VOLITION

The whole of human behaviour may be classified into two types—Non-Volitional and Volitional. Non-Volitional behaviour is like an unimpeded stream of action, in which case the individual does not have to make any efforts to accomplish an act. In case of volitional behaviour, though the native tendencies and emotional impulses and their organized systems like sentiments and the self-sentiment are strong motive forces, yet, possession of them is not enough to move the possessor to act. In a situation of conflict in which the individual has to choose one course out of two or more, even highly organised self may not be able to win over other opposing forces, especially in moral actions. To perform such actions of great resistance, the individual is re-inforced by another driving force, the volition, in addition to the force of his sentiments and master-sentiment.

ITS MEANING

1. According to old psychology it was regarded to be a

facutly of the mind. But the faculty psychology has, now, become quite obsolete.

2. Orthodox psychologists regarded it to be an additional mental energy, arising out of organism's mental structure.

3. To Woodburne it is nothing but "stick-to-it-iveness", that state of the mind which enables one to stick to a task till it is complete.

4. Angell said, "the whole mind active, this is the will."

5. Modern psychologists like James define it as "action in the line of the greatest resistance", caused by the worth of action.

6. Drever says "the will is character in action." It means when action takes place as guided by the will force, volition becomes a basis of character.

According to him it derives strength from the self. Thus, will tells the person that action should be considered in relation to the main aims and desires of the self as a whole with its dominant sentiments. Thus the will is expressive of the character as a whole, e.g., drinking calls forth ideals of other aspects of the self, their associated impulses, and enduring sentiments which form so large a part of the self.

Thus, McDougall's will is due to the self-regarding sentiment. Drever and Nunn also believe that some idea of the self is a supremely important item in the deliberate choice between two conflicting lines of action. According to C.W. Vallentine, the self is simply a point, a stage in this process of important moral decisions and in a highly developed type of character.

CONDITIONS OF WILL

Following are the two conditions upon which the strong will depends:

(a) Natural vividness of the desire which varies from person to person,

(b) Strength of the self-regarding sentiment, e.g., Gandhiji's and Buddha's vision of their respective selves.

IMPORTANCE AND SUGGESTIONS FOR THE TEACHERS

Education of the will power is of great importance for the teacher. It is the basis of character and all moral education. The teacher should aim at:

(i) the development of a strong self-regarding sentiment

(ii) anti-social desires should be properly trained.

(iii) training should take place through love, respect and persuation and not through fear. Will to obey, will to clean teeth, etc. can be re-inforced in this way.

CHARACTER

MEANING

With reference to one's behaviour and action character implies something relatively permanent. It is the organisation of the self as revealed in conduct whether morally good or bad. **It** means :

(a) A man ceases to be the creature of varying and conflicting impulses and that he has achieved some stability of behaviour.

(b) He ceases to be dominated by the influence of persons with him at the moment and is able to stick to his own line of action.

(c) That he builds up a few main sentiments, especially, a strong master-sentiment which dominates his conduct, enabling him to control all his actions by some ideal of conduct.

(d) That he becomes more stable and consistent in his behaviour.

(e) That he reveals what we usually call character.

Thus a good character refers to an individual's moral and social conduct, such as is befitting the members of human society.

According to Francis F. Powers of Washington University character is the product of social functioning. It has been defined as "one's consistency in conduct-trends, outer and inner, in conformity with the group in which he lives."

To Vallentine fully fashioned character is dominated by some ideals.

In its totality character is the finest flower resulting from the development of innate as well as acquired patterns of one's actions which are somewhat consistent.

ELEMENTS OF STABLE CHARACTER

1. Broadly speaking character has its original source in the innate tendencies of the child, such as instincts, emotions, certain biological drives and physiological conditions.

2. But much is contributed towards the stability of character by aquired characteristics and development of sentiments, habits, self-sentiment and will power.

According to E. Webb stability of character depends upon a general factor, "the persistence of motives" or "consistency of action resulting from volition or will". This factor is labelled by him as "w". Such traits of character as perseverance, kindness, trustworthiness etc. depend upon this 'w' factor which involves the power of looking ahead and checking immediate impulses by the thought of future. R. V. Cattell also holds the same.

According to Burt stability of character depends on the ratio of two factors.

(a) Intensity of general emotionality and

(b) Intelligence.

IMPORTANCE IN EDUCATION

Formation of good character is the ultimate aim of all educators. Education without the aim of formation of character is of no use to humanity. So a teacher should know the nature and meaning of character and its various elements. He should take into consideration the innate endowments of the child's nature and should provide best possible environment in which good moral sentiments and a strong self-sentiment as well as a strong will-power to act in the direction of moral acts may develop. It is also very essential that the teacher himself should be an embodiment of high character and a man of great integrity and high ideals.

QUESTIONS

1. What do you understand by sentiment ? How are they formed?
2. What are main characteristics of sentiments? What is their importance in Education?
3. Give the psychological nature of Self-Regarding sentiment and mention how it is formed.
4. "Self-Complex must be thought of not statically but dynamically." Explain and illustrate.
5. What do you understand by Volition? What is its significance in Education?
6. What do you understand by character? What are the elements of stable character?
7. "Will is character in action." Explain.

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CHAPTER IX

INTERESTS, IDEALS AND ATTITUDES

Development is a many-sided process. Along with the development of sentiments, self-regarding sentiment, character and intellect also develop interests, attitudes and certain ideals in children. These are also acquired characteristics, and they also play important roles in directing and controlling human behaviour. They are also dynamic systems of human personality-in-action.

All educational activities are built upon interests. Almost whole of life is a long continuous activity in the line of one's own interest. Whatever one does, does for some kind of interest in it An uninteresting work or activity means a lifeless burden. Thus interest is of great significance in education.

MEANING OF INTEREST

An interest is a "tendency to become absorbed in an experience and to continue it".

Interest has been viewed from two different angles—objective and subjective.

In Latin interest means "it matters" or "it concerns". A thing that interests us is a thing that matters to us. In this way interest denotes something which exists outside.

Subjectively, interest represents the very experience of a person. It is not the object alone which gives rise to interest. Really speaking, it is the subjective conditions of the person which are responsible for the arousal of interst in a particular object. Prof. Stout describes this as "affective-conative aspect of instincts". Drever describes it as instinctive interest.

To make a compromise between the two, these are not two different descriptions. Interest includes both the aspets. Mere object or knowledge of object can not give rise to interest. Qualities of the object are nothing and meaningless, unless there is something which assigns a meaning to them. This meaning emerges from the within-self of the individual himself.

In order to create interest the object must appeal to the individual. Interest lies in this appeal. This appeal takes place through the inner man, which is composed of certain instincts, emotions, sentiments and other subjective needs. Thus, to quote Ross according to this subjective account "interest is born out of an emotion stirring round some object".

Therefore, the true account of interest takes into consideration both the objective as well as the subjective conditions of the individual. The object, too, is essential. Unless the object has proper elements to stimulate subjective conditions, interest can not be aroused in that object. The object provides the stimulus while the subject a set of machine. Thus the environment and the inner psychic set-up both play an important part in the formation of interest.

FORMATION

The process of interest-formation begins right at birth and continues till late in the old age. Different configurations of experiences are formed, and those which are pleasant, develop into patterns of interest.

The formation of interest depends upon :

(a) The inner psychic set-up of an individual.

(b) The environmental situations.

If a pleasant experience aroused by a particular object in a particular environment repeats itself again and again, it gathers strength and becomes permanent appeal to the organism with the result that whenever a corresponding stimulus is received it gives rise to interest.

PROMOTING AND AROUSING INTEREST

Any object not interesting in itself may become interesting by way of its association with an object in which an interest already exits. Thus, things not interesting in their own right borrow an interest which becomes as real and as strong as any natively interesting thing e.g., a child interested in a flower will also find interest in reading about it, writing about it, in drawing it etc.. In this way the interest expands. The teacher should utilize this fact in his teaching and should try to arouse a larger number of interests in children.

He should start with the things and objects in which the child is basically interested and then should proceed on with their associated aspects. The basic rule is "to begin with the learner's 'native' interests so far as these can definitely be determined and to offer him experiences that have some immediate connection with them." No instruction can succeed, if not based on these interests, because it would lack a base from which to start. The Project Method is based on the recognition of this rule, because in it there is a single basic enthusiasm of definite purpose to smooth the way for a host of related skills.

2. Another principle is that of direct, concrete sensory stimulation, that is, to make things, objects and events as real as possible. That is perhaps the reason why visual aids greatly intensify the clearness of the item to be taught.

3. A third method for promoting interest is urging the learner to make all knowledge as personal 'as possible'. Anything that can be connected with one's welfare and individuality is to that extent more interesting than that which is remote and irrelevent. Knowledge to be imparted should be made as concerned with the learner's life as possible.

4. Arousal of interest also depends upon the "congruence" between the past knowledge and the knowledge to be imparted. If there is no link between these two there can be no interest in the activity. Thus, knowledge to be imparted should be related and connected with past knowledge of the child.

SPAN OF INTEREST

Interests are not permanent. Economic and other considerations combine to restrict any marked changes in interests at maturity. There is a low degree of permanence during the pre-school and elementary school period, a moderate amount in high school and college, and a high measure of it in adult life. Certain superficial interests disappear very soon.

In our practical life educational and vocational interests are of maximum concern.

IMPORTANCE IN EDUCATION

A knowledge of interest is essential for every teacher, as it helps him in his work to a very great extent.

1. Interests determine what and to what extent a child can learn as they determine the selectivity of the learner's response, rapidity of acquisition, satisfaction and fullness of recall etc..

2. Teaching through intersts of the child means very effective, efficient and enduring learning.

3. It means saving of time and energy.

4. It means perfect discipline and order in the class.

5. It means intense attention and high degree of concentration of the mind.

ATTITUDES

Abiding attitudes are the most important outcome of the experience of the child. They are considered to be the by-products of learning and instruction. They are valuable results of development. They are emotionalized opinions formed through experiences.

MEANING

Attitudes have been described as "emotionally toned predispositions towards objects and ideas".

They are said to be somewhat lasting generalizations of experiences e.g., attitudes towards divorce, democracy and dictatorship etc.. In other words they are generalized habits which partially control human behaviour, thinking and learning.

Prof. Hart Mann of Columbia University Teachers College says that they may be conveniently thought of as latent value-reactions. Values are determined largely by the attitudes which a person has towards things and ideas. Spranger gives six values :

1. Theoretical, which means an attitude that knowledge is a precious thing in life.

2. Aesthetic, which means an attitude of joy and loveliness towards art.

3. Economic, which means an attitude which exalts material possession above all else.

4. Social, which means an attitude to recognise, that friendly human contacts are relatively higher than other 'goods'.

5. Religious, it is an attitude of indifference to worldly things and ambition for spiritual development.

THEIR FORMATION

Attitudes grow and develop like all other features of mental life. Allport has distinguished four common processes involved in the making of attitudes.

1. Integration of various specific responses of a similar type into a definite pattern of mental state.

2. Individuation of a definite mental set.

3. The effects of some "trauma" of fixation resulting from a startling and dramatic experience. This represents a sudden change in the mental state caused by some vivid experience e.g., the student abandons medical career because of repugnance to dissection.

4. Readiness for adoption through imitation. By way of imitation some sort of readiness to adopt an ideal develops.

Thus attitudes are caught as often as they are taught. Many of the attitudes are acquired as second hand from social interactions. Adults pickup most of their social and political attitudes from news-papers. Many other attitudes are acquired through their own experiences.

Existing Attitudes Change

Attitudes are not permanent. They are retained as long as they yield satisfaction. Many social attitudes are changed by conversion, economic disaster and falling in love.

The biggest single factor in changing attitudes is the propaganda. Besides this by the application of appropriate stimuli all attitudes can be changed. Thus attitudes are flexible.

The motion pictures have been found to possess an amazing power to shake attitudes for good or ill.

Importance in Education

A major responsibility of instruction is the inculcation of desirable attitudes and the elimination of unsuitable ones. The main task of the teacher, therefore, is

1. To develop in children proper social attitudes, that is, a desirable attitude towards the society and the other people.

2. To check and modify undersirable attitudes by applying suitable stimuli.

The teacher can achieve these two ends through the introduction of prestige, expert influence, major opinion, evidence of rationality etc.. He should provide the pupils with proper environment and should himself behave in the line of desirable attitudes. He should be free from undesirable attitudes. If a teacher himself has undesirable attitudes, they are bound to be caught by the pupils.

If education succeeds in the inculcation of good social and moral attitudes in children, they will become strong motive-forces of their behaviour in after-life.

IDEALS

Like attitudes Ideals are also specific mental states. They are distinguished from attitudes by their more normative and imperative character. An ideal, generally, implies a large measure of social and personal concern about its content. Ideals are fewer in number than attitudes and they form broad guiding principles of conduct. Ideals are more comprehensive ways of 'readiness to respond'. They are important springs of human actions.

FORMATION

Though natural tendencies play a great role, ideals are the products of experience. They develop out of some important conflict of values or by way of deep impression of admirable personalities.

The formation of ideals correspond to the intellectual development of the child. 'Low' ideals signify a narrow and starved life, 'high' ideals, a rich and broad-minded life.

FUNCTION

The function of ideals is to give unity, firmness and direction to life. Without ideals, the individual lacks stability and inner strength. When once firmly established, they become main springs of actions. A highly integrated personality is always dominated by certain high ideals.

The school is a place where the ground for high ideals can be prepared. The teacher should always keep them before his eyes and should behave and direct the pupils in the desired way. His own life should also reflect such high ideals and virtues. Through approval, disapproval, insightful and imaginative testing of consequences and critical appraisal of goals according to some principles, he may achieve wonderful results. But it all depends upon the wisdom of the teacher.

QUESTIONS

1. How will you define 'Interests'? Why are they important for the teacher?

2. Discuss how the Interests are formed and mention what a teacher can do to enrich the life of pupils with Interests.
3. Describe the psychological nature of Attitudes and mention the processes involved in the making of Attitudes.
4. In what way Attitudes differ from Ideals? What is their importance in Education?
5. What do you understand by an Ideal? What is the importance of Ideals in Education?

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CHAPTER X

EMOTIONAL AND SOCIAL DEVELOPMENT

The child starts with highly emotional life and marches on towards a social life. Thus, emotional and social development are two important phases of development. Let us discuss them separately.

EMOTIONAL DEVELOPMENT

Emotional behaviour of the child plays a large part in the adjustment of the child to his environment.

Emotional Behaviour of the Infant

The first emotional behaviour of child is vague, undirected movements. Emotional experiences are more overwhelming at this stage. But they are rather generalized and undefined and widely diffused. As the child grows, these activities become specialized. In some situations the child cries, in others throws his arms, and kicks in still others. Thus with progressive increase in age, emotional behaviour is modified and there appears a decrease of frequency of diffuse "blowing off" types of emotional behaviour.

Nature of Emotional Activities

Emotional behaviour and activities are the symptoms of some kind of maladjustment. They have a great adaptive value. They begin in the individual with the necessity of making internal or subjective and social adjustments. This process of adjustment has been viewed from three angles :

(a) Physiological changes involved in adjustment.
(b) Changes in the individual.
(c) The effect of emotional expression upon other people. It means adjustment to other people.

(a) When an emotion is excited certain changes in the blood, nervous system and glandular functions are produced. They produce marked effects upon human behaviour. Thus every emotional activity is a biological defence-device. First, emotional activity of the infant is a reaction against circumstances which constitute a threat against survival. This is exhibited in new-born children in 'Moro Complex' which is an emergency response, and then in the "Clasping Response". By the 4th month Moro Complex disappears and is replaced by startle patterns.

(b) Emotional activities and experiences leave some permanent effects upon the individual. Out of emotional excitements, he develops certain complexes, sentiments and attitudes which change the individual to a great extent. Thus various psychological changes occur within the individual.

(c) Emotional behaviour begins as a personal adjustment, but usually it is continued because it influences others. The first cry is the personal stimulus but afterwards the child learns that his cry affects the mother and learns that emotions influence others.

As the child grows older he learns so many behaviour-patterns in order to influence his parents or teachers.

CHANGES IN EXPRESSION OF EMOTION

As the child advances with age changes in the expression of emotion take place. Young baby when frightened, cries and such actions as clutching, fleeing, running to his parents etc., appear. When he is able to talk, he only speaks about his fear. Thus from the beginning onward there is a gradual falling off in the frequency of episodes of fear. With increased emotional maturity develops an ability to suffer in silence. Thus the child learns to conceal his emotions. By the time children have reached school age, changes in emotional reactions to the behaviour of others also appear. Many children object to parental pats, caresses and other expressions of love which they had welcomed earlier.

Several factors contribute to this change in overt expression of emotions. They are :

(a) Acquisition of numerous ways of expressing emotions with the development of intellectual and motor capacities.

(b) Changes in his susceptibility as he matures.

(c) Factors in the everyday environment which consists of advice of the elders, examples set by others, imposed discipline, rational thinking and other social pressures.

Thus the child as he grows older tends to shift from whole hearted, overt and direct forms of expression to more graded covert and indirect forms of expression. Concealing emotions is not good as it leads to misunderstanding and hardship. Resentment, desires, temptations and feelings of guilt become easier to be borne.

HEALTHY EMOTIONAL DEVELOPMENT

The best criteria for this is that of versatality, i.e., to teach the child to be more and more sensitive to the significance of happenings in the world about him. No type of emotional training is wholesome which tends to make a child insensitive to what is going on.

Second is that of increasing the range and variety of his emotional responses. He should develop in all the directions. He should learn to enjoy his inner experiences and the feelings of others and to respond to them properly.

Situations that stir up socially undesirable emotions should be avoided as far as possible.

Strong self-regarding sentiment should be developed which will help the individual to control and direct his emotions.

We should utilize our emotional education properly. Unrestrained blowing off gradually gives way to analysis and more effective living. Development should be in this line.

The teacher should never lose sight of two rules :

1. The same situation may lead to different emotional acts in different individuals and to different acts in the same individual at different times.

2. The same overt emotional behaviour in an individual may be caused by quite different stimuli.

SOCIAL DEVELOPMENT

As the child grows his emotional reactions are modified in two ways :

(a) The stimuli capable of arousing emotional change and
(b) The emotional responses

are controlled.

This is due to the fact that the demands of the society force the growing child to satisfy his emotional drives in definitely desirable ways. Thus, social development of the child begins.

MEANING

According to D.M. Johnson, "Social development proceeds from the simple, undifferentiated and pliable behaviour-patterns of the child towards the complex specific and relatively permanent customs and attitudes of the adult culture." By culture he means the way of life, the patterns of habits, customs, attitudes and beliefs, common to the people living in a society.

Social development is a part of learning process. Social habits, attitudes and personality-traits are acquired through social interaction. They depend upon motivation, practice and examples.

Francis F. Power, defines it as "the progressive improvement through directed activity of the individual in the comprehension of the social heritage and the formation of flexible conduct-patterns of reasonable conformity with this heritage." It means that the individual develops consciousness of the social traditions and cultural conventions amidst which he lives his life and makes efforts to mould his behaviour and conduct in conformity with them. He becomes perfectly aware of what the society wants and what it rejects. To this he makes desirable adjustments and develops certain new social, cultural, and moral conduct-patterns which become somewhat permanent. He also develops certain socio-cultural habits. All these taken together point out towards his social development.

SOCIAL BEHAVIOUR IN EARLY CHILDHOOD

The genesis of social development includes two things :

(a) Changing the predominantly egoistic infant.

(b) Training the child to act in socially desirable ways.

The first is the ground on which the structure of the second is to be raised. Let us therefore consider the first in details.

The infant is not a social being at all. His first reaction to his world is a vague and meaningless cry. This first cry is simply a spontaneous reflex act. Thus, the infant is socially blind.

Gradually some meaning is attached through experience to his cry. It is a big step towards socialization of the child. Two or three months old infants stop crying when picked up. The first social smile appears about the same time.

Six or eight months old infants take a positive turn at this stage. They can discriminate between a smiling face and an angry one. Infants at this stage show no interest in their partners.

Towards the end of the first year the infant begins to make efforts to attract attention and imitate social relations by putting on adults clothes and making loud noise. He is interested in the play material, but does not like companions. He fights but only due to the toy and not for being envious.

Fourteenth to eighteenth month period is a transitional period in which the child develops a friendly attitude towards the partner.

By the 25th month there are evidences of real co-operation.

Between the age two and three years, the child develops a consciousness of his ego.

In the early months of life the infant has no ego, no “self” and “his life is a series of reactions to chemical changes within and physical disturbances without. He recognises no difference between himself and the rest of the world." But gradually he learns by experience "the boundaries between self and not-self". Thus the main characteristics of the infant behaviour are that it is

1. Random.
2. Diffuse.
3. Undifferentiated and unbalanced.
4. Non-centralized.
5. Transitory, not fixed.
6. Immediate, devoted to the satisfaction of immediate needs.

It is with these general characteristics that social development starts.

The real socialization begins after the age of two. At this stage the child likes his desires, his successes and failures as being his own and defends if necessary. "This pre-occupation with his own likes and dislikes is the reason for the well-known period of negativism called stubbornness."

With the improvement of ability to communicate with others by language and gesture which takes place about the third year his skill in social intercourse increases and negativism diminishes. He enjoys putting himself in the other fellow's shoes, identifying them, sharing their goals and sympathising with their troubles.

Between three and six years children play games in which they exchange their own selves with parents, other children and animals. "Trying on other egoes is as much fun as trying on new clothes." By this time the child foregoes his own immediate gratifications in order to win friends. He becomes more amenable to adult methods of social control. "His ego goes up and down according to his social success."

A child of five, thus, has graduated from the simple physiological rhythms of the new-born baby and is well on his way to becoming a socialized representative of his culture and his social group. He knows what other boys and girls do and what they expect of him. When he begins to go to school he takes on the characteristics of the children, he plays with. Thus a new set of standards external to the family enters into the youth's development.

FACTORS IN SOCIALIZATION

Two types of factors are involved in the socialization of the individual :

(a) Physical factors.
(b) Institutional factors.

Following are the three phases of physical factors :

(a) Physiological conditions.
(b) Innate primary likes and dislikes.
(c) Physical environment.

Institutional factors that are a part of the physical environment are :

(a) Thousands of pressure groups.
(b) The Home.
(c) The Church.
(d) The Press.
(e) The Club.
(f) The Government.
(g) Language.
(h) Movies and Talkies.
(i) Changing Times.
(j) Education.

These factors function as systematic categories of stimuli in the socialization of the individual. There is continuous inter-action of the individual with these factors of the environment. Besides certain physiological conditions and drives, for example, glands, nervous system etc., also play a prominent part in this process.

EFFECT OF PARENTAL BEHAVIOUR ON SOCIAL DEVELOPMENT OF THE INDIVIDUAL

The child should be given enough care so that he may have a properly developed feeling of the security in the home; but not so much as his individual assertiveness is destroyed.

He should have enough affection, but not so much that he fails to broaden his love-life to include those outside the family.

He should be guided in the solution of problems but not so much that he never learns to face a difficulty himself.

OVER-DEVOTION

Over-devotion results in universal attachment of the child to his parents. Sometimes, the child may never be able to break the ties, resulting in some perverse tendencies.

Some children as a result of this "unwarranted bondage" develop antagonistic attitude towards the parents. Over-devotion becomes nagging to the child.

Over-devotion of the parents is probably the result of the lack of devotion in their own childhood, or maladjusted marital relations, loss of mate, loss of another child or a thwarting of vocational ambition.

LACK OF DEVOTION

A parent who gives the child no devotion and who is cold, stern and forbidding may develop a hunger for affection in the child which leaves him fearful, resentful and morose. In infancy this neglect often leads to auto-erotic habits. In later life, this may lead him to devote untold energy in a vain hunt for some one to love him enough to make up of his infantile starvation.

EFFECT OF PARENTAL AMBITIONS

Some parents look upon their children as a means of achieving their own thwarted ambitions or of "carrying on the great work" they have taken. This results in over-concern on the part of parents due to which superior children fail to make proper advancement in school. The child finds that his parents are insatiable and finally falls to rebel. This may result in the frustration of the parents which may cause an increase in troubles. The child develops an anxiety-attitude that may last all through his life. Such children approach every task with feverish zeal accompanied by a fear of failure which makes life a burden for them. The parents and the teachers, therefore, should develop a balanced outlook.

Thus, the attitudes and the personalities of the parents, especially of the mother and the teachers contribute more to the social development of the child's personality than do external features of his environment. They should let the child be only himself. They should be natural in their behaviour and should not try to enslave the child.

Relations between siblings also exercise great influence upon the social development of the child. Adler contends that an only child develops a feeling of power and dependence upon his parents. He develops a feeling of inferiority which resulting in compensation develops domineering attitude in the child. Jealousy develops as a result of competition for the affection and attention of the parents.

LEVELS OF SOCIAL MATURITY OR DEVELOPMENT

Practically every normal individual is mentally capable of mastering the mores of his group, but many people do not do so. Those who do not do so are at a low stage of social maturity. Thus the level of social adjustment that a person had attained is indicated by the relation between his conduct and the normal adjustment for his age and group in motor, emotional and abstract mental control.

The lowest level of social development is its negative aspect, when the child behaves in a negative way.

Next higher level is the positive aspect of social adjustment when the child learns to be very docile to keep alert to the authorities and to conform to that which is imposed upon him.

Higher than that is the mutual give and take social co-operation when child learns to be considerate of the rights of others.

The highest is the adjustment to understand others. At this stage the child must learn that he can expect others to cater to him to satisfy all his whims or to act in fixed and automatic ways.

The socially matured person is the one who has learnt to understand and to deal with other people. He knows that people are different and that each social situation must be studied and then the actions must be determined by the dominant factors in that situation. He develops a sympathetic and reasonable appreciation of the wants, the attitude and the interest of those around him. This understanding is a social insight or social intelligence. A fully socially matured individual should have a high degree of social intelligence.

METHODS OF STUDYING SOCIAL BEHAVIOUR

Following are the various methods and techniques of studying social development :

1. *Biographical Method*

This can be successfully adopted by mothers and nurses. In this special attention is paid towards the earliest manifestations and elaborations of social behaviour.

2. *Rating Method*

Rating from observation of spontaneous activity e.g., placing two or more children together, observing their spontaneous reactions to each other and recording by a person who views the situation from behind a one-way-vision screen.

3. *Tests Method*

Roger's personality schedules and 'guess-who-tests' are well known techniques of this sort. In these the experimenter puts questions as "who is the smartest boy in the class?" "Are you just like him?" "Would you like to be like him?" The answers give a quantitative evaluation of the child's social development. In the 'guess-who-tests' the child is presented with word pictures or verbal portraits to read each one and then to write down the names of any boys or girls who might fit that portrait.

4. *Experimental Method*

Experiment is the last stage in scientific discovery. It presents the child with controlled situations followed by scientific situations.

5. *Expressive Technique*

This presents the child with situations which encourage children to express freely their attitudes towards each other e.g., dramatic play with dolls and toys, dramatic products, puppet shows, display of pictures, story-telling, drawing and games.

6. *Social Climates*

In this, attempts are made to study the total atmospheric effect of a situation upon the individual in a social group.

IMPORTANCE IN EDUCATION

Desirable social development of the pupils is the fundamental task of the teachers and education. The child develops ultimately into a human being and every human being is a social being. Thus socialization is tremendously important an aspect of education.

The teacher, therefore, should have the responsibility of developing favourable social attitudes in children.

The most important single product of social functioning is character. Therefore, social development as an important duty of the teacher becomes more essential.

The education therefore should give the child three phases of training :

(a) Mastery of certain facts, the heritage of all mankind.

(b) Mores of the group.

(c) Social techniques—this includes a technique of adjustment and an encouragement to develop a programme of self-improvement in social functioning.

HABITS

The essence of socialization and character is habit-formation. The words 'mores', morals etc., give clear evidence of the early recognition of the role of habit-formation in the socialization of both the individual and the group. 'Mores' in Latin means social habits. Let us therefore study habits in some details.

MEANING AND NATURE OF HABITS

Habits are looked upon as definitely acquired modes of response. They are not innate but are learnt by way of experience from the environment the child lives in. They are modes of reactions which are fixed. They tend to crystallize an individual's behaviour, forcing him to respond in a fixed way without the use of intelligence and reason.

Habits may be said to arise in the service of instincts. Their formation largely depends upon instincts. Instincts themselves are racial habits.

After having performed an action once or twice or more, amount of attention and efforts are lessened, till at last it is performed mechanically like a reflex act. Then it becomes habit.

REASONS OF IMPORTANCE

Habits play an important role in the life of the human being. They lessen the burden of life. Following are some of the advantages that we derive out of them :

1. They save our time. Once a habit is formed we do not require much time to do it next time. A large number of routine-works we perform only by way of habits. Morning calls, eating, drinking, walking, sleeping, bathing and toilet etc. are done just as habits. Had we been required to learn them afresh everyday, it would not have been possible to push life ahead so easily. Thus, habits save our time by not requiring us to re-learn and waste time over a task that has already been done once or twice.

2. They prevent fatigue. Were there no habits, we would have been learning and re-learning every task on every occasion we would need that. This would have caused

much fatigue destroying all incentive and enthusiasm to work. But as we develop a number of habits in course of experience right from birth to maturity we do number of tasks with ease and without feeling any exertion.

3. They make us more accurate. Accuracy in a task comes only after mastering the procedure or at least certain aspects of procedure thoroughly. In other words we can say that when we become habituated in performing a task, only then the accuracy emerges. Thus accuracy is just the habit-formation and its resulting behaviour.

4. Higher learning is also based to a certain extent upon habit. As higher learning involves many activities, that need be done immediately and habitually.

5. Efficiency demands that anything which is to be done should be performed with ease and facility. This can be possible only when performance has become a habit.

LIMITATIONS AND OBJECTIONS

1. They retard the flow of mental energy into new channels. So adjustment in new situations is not helped by habits.

2. They are mechanical and stereotyped, not adaptable to new things.

3. They make the personality highly standardized which we do not want. We do not want a personality which behaves in the same way at all occasions.

4. Habits are very effective in the early childhood. But their effect may be in the wrong directions which is highly objectionable.

5. Habits once formed are difficult to be broken. If some wrong habit is formed once, it becomes difficult to break it.

6. They deprive us of interest, feelings and emotionality which are necessary for success as they increase general activity. When we do a work habitually we experience no feeling of any kind and the work goes on in a mechanical way.

How to Cultivate Good Habits

Habits play an important role in the life of human beings. Success and social progress in life may be accellerated by forming good habits and breaking habits. Good habits are an asset to one's life. They should, therefore be, developed from the very beginning. Following considerations are of great help in the cultivation of good habits :

1. Firm determination is very necessary before a good habit is developed. What has once been decided to be done, it must be done at all times. This can be possible only when the individual has taken a pledge to do the same. Such an act of pledging strengthens the will-power and utimately the act develops into a habit.

2. No slip or lapse should be allowed. Precaution and efforts should be made until it is deeply rooted in the life.

3. Seize first very opportunity to act. No delay or postponement of the action should be allowed.

4. As James said, do something every day to strengthen the learnt act which is to become a habit.

5. There should be no preaching but learning by doing.

6. Strike while the iron is hot. When the opportunity comes make the best use of it.

7. Thorndike's law of reward and punishment should be made use of. Reward may be given when an act of good habit is performed. This may ultimately lead to habit-formation.

How to Break Bad Habits

It is equally important to break bad habits. Though it is difficult, yet certain ways have been found effective in breaking them. They are :

1. Disuse and Neglect—When a bad habit is not given a chance of expression for a long time and remains in disuse, it is ultimately broken. Through neglect for a long period, it becomes weak and ultimately breaks down. This is the law of nature that the more an experience is repeated, the more strong and fixed it becomes, while the more it is neglected the more lifeless and inactive it becomes.

2. Developing counter good habits—Another way of breaking bad habits is to develop counter habits that are good and that inhibit bad habits. To tell a lie is a bad habit. To break it we should develop a strong counter habit of telling truth. The stronger is the habit of telling truth, the weaker will be the habit of telling a lie. A time may come when the habit of telling truth may become strongest and the habit of telling a lie may become completely extinct. One thing has to be remembered. Habits should not be rooted out by force as in that case, it may produce fear, anxiety, nervousness, mental complex or some other abnormality.

QUESTIONS

1. Describe the emotional behaviour and the nature of emotional activities of the infant. What is the importance of these activities in his life?
2. What changes occur in emotional expression as the child grows up? What are the criteria of healthy emotional development? How will you guide the child towards this aim?
3. What do you understand by the social development? Describe the social behaviour of early childhood and trace its development onwards.
4. What are uarious factors involved in Socilization? In what way parental behaviour influence the social development of the child?
5. In what do the 'Lack of Devotion' and 'Parental Ambitions' result as regards the social development of the child.
6. Describe what you understand by 'social maturity'.
7. Discuss various methods of studying social behaviour.
8. Discuss psychological nature of habits and show their usefulness in life.
9. How will you break bad habits and cultivate good habits?

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CHAPTER XI

ATTENTION

At the time of birth the infant is quite ignorant about his environment. He knows nothing about his surroundings. The world is to him "a big booming buzzing confusion". His consciousness is a clean slate. But as he grows, he begins to know his world and his environment. This knowing activity involves a process of mind that consists of various functions which are :

1. Attending.
2. Sensing.
3. Perceiving.
4. Thinking and Reasoning.

We shall discuss them separately one by one.

Psychological Nature of Attention

1. At one time attention was considered to be a faculty of mind, capable of being directed and trained. But no such thing as 'attention taken by itself' exists. It has no separate entity anywhere within the mind.

2. To some of the psychologists, attention, like emotion, is an activity of the person attending. This is quite vague and does not explain what attention is.

3. Some say it is "a mode of experience" and therefore, apart from the subject and the object of attention it is nothing.

4. Old psychologists took an intellectual view of attention. They emphasized its cognitive aspect and described it as "focussing of consciousness upon an idea or object".

Thus, according to these psychologists attention is the process of getting an object clearly before our mind, just as a camera can by focussing make a blurred figure clearly visible.

So clearness seems to be the result of attention according to old psychologists. Titchener said, "the problem of attention centres in the fact of sensible clearness."

The truth of this can not be denied. Yet, it does not give a comprehensive view of the nature of attention. Attention is not purely an intellectual activity. It also involves the affective and conative aspects of the mind. These two factors are entirely neglected in the intellectual account of the old psychologists. Comprehension and clearness are not enough to explain the nature of attention.

5. Modern psychologists recognise this affective-conative aspect of attention. McDougall says attention is "striving to cognize" or "merely conation" or "striving considered from the point of view of its effects on cognitive process". So stronger the conation, more intense the attention will be.

6. Attention has also been described as a "selective process of the mind". A live human being, awakened is bombarded by stimuli of all variety from objects and people via all the senses which keep him informed of the affairs of the external world and affairs of the inner man. But the stimuli are hundreds and the human being can not react to every one of them simultaneously. What happens is that his mind selects some and ignores others. This is the process of attention.

This selective-process-account of attention is not totally different from previous accounts. If we think why mind selects only one object and ignores others, we come to the same conclusion that it is the "affective-conative aspect" of the mind. The individual tries to get along in this world of confusion to find food, to drink, to win fame and fortune and to protect his reputation. He is re-enforced by his own nature and as a result of these inner motives he selects the one which satisfies his needs, e.g., a hungry person will attempt to get food only and will neglect others.

7. According to Gestalt psychology, attention is "a figure-upon-a--ground-reaction". It means that attention is a reaction of the figure-event in a particular background. The figure and the ground are perceived simultaneously and the reaction

produced by the figure is what we call attention. Attention is, thus, according to the Gestaltists "a process of facilitating the response to the figure-event and inhabiting the competition of ground events." Figure-event is the dominant event in a situation which attracts attention.

Kinds of Attention

Ross has given the following kinds of attention :

1. Volitional.
2. Non-volitional.

In the volitional attention the individual has to make deliberate efforts. In the non-volitional, no efforts of will are made.

Volitional attention again, is of two types—Implicit and Explicit. It is implicit when only a single effort of will is needed. It is explicit when the individual has to make efforts again and again.

Non-volitional attention, too, is of two types—Spontaneous and Enforced. It is spontaneous when the compelling forces are the acquired dispositions, such as natural interests, sentiments and ideals. It is enforced when stimulation of sense organs or instincts are the driving forces.

ATTENTION AND INTEREST

We have, so far, discussed what attention is and what its various kinds are. A question arises, now, why do we attend to an object? Psychologically, we have different motives which make us attend. In ordinary language, they say, we attend because we are interested in the object. Thus, the probem of attention becomes the problem of interest. So it becomes imperative to study the relationship between the attention and interest. It is also very important from the point of view of the teacher.

Prior to World-War First, educators were much concerned over the question as to which had genetic priority. It was argued by the disciplinarians and the conservatives that attention comes first and interest flows out of it. But those who supported free discipline and child's active participation said that interest comes first.

To the laboratory psychologists the issue is as fictitious and artificial as the problem of the hen-and-the-egg. Since interest is most safely defined as the "feeling which accompanies attention", it is obvious that the two factors are inseparable and they develop simultaneously. The only differences are:

1. That, interest is ordinarily less dependent upon the structure of the objective situation than attention.

2. That, it is a "function of the history and the present conditions of the organism". It means that the interest is largely determined by the racial habits, the instincts, the emotions, sentiments, ideals and other urges of the organism.

3. That, the interest has a relatively enduring and persistent quality which attention lacks.

According to Ross, the relation of interest and attention is so close as none of them can do without the other. They go hand in hand together. When one is explicitly present, the other is implicitly there. One gives rise to the other. They are merely two different ways of looking at the same thing. Both are built upon the same ground, namely "an organized disposition in the mental structure" i.e., both attention and interest are determined by the subjective conditions of the individual.

In the opinion of Ross, interest is used for the structure itself, while attention is used for the experience which that structure determines. Every organism has instinctive and other psychological dispositions. We may, therefore talk of instinctive interest, biological interest, and interest dominated by sentiments. These dispositions themselves are the retainers of the interest. Attention is that experience or activity which is determined by these dispositions. Thus, attention is "being active", while to have an interest in any object is to "be ready to pay attention to it". Attention, thus, implies the activity of mental structure, while interest is structure itself. In this way we can say that there is the difference of degree or stages only between attention and interest. Interest is a preparatory stage of attention, a state of being readiness. Interest is inactive structure. In the words of McDougall, "Interest is latent attention and attention is interest in action." In the words of Stout, "attention is interest determining cognitive process", i.e. attention is necessary for the acquisition of knowledge.

But the above relationship immediately fits well in case of non-volitional attention. What about volitional attention, in which case the individual attends to even those objects in which he is not interested at all. This might seem to spoil the above relationship. But that is not so. The fact is that even the objects of volitional attention are objects of interest, though indirectly if not directly. Thus, even in case of volitional attention the relationship that "attention is interest in action" works all right.

CONDITIONS OF ATTENTION

For the sake of convenience, conditions upon which depends the function of attention, can be divided into two categories :

1. Subjective conditions.
2. Objective conditions.

The subjective conditions include the interests, sentiments, instinctive and emotional dispositions, habits, attitudes, ideals and other prevailing tendencies.

The objective conditions include the elements of the stimulus or the situations. If the subjective conditions are strong, that is, the individual has genuine and high degree of interest in a particular thing, the attention will be more intense. In the same way, if the objective conditions are strong, it will appeal more to the individual with the result that he will attend more keenly.

On the other hand an object by reason of its intensity alone may force itself into the consciousness, e.g., a loud sound, bright light, etc.. Intensity of the object, therefore, is an important condition of attention.

In the objective conditions it is not only the intensity that captures the attention, but contrast between the object and the background also produces a strong action, e.g., fall of a pin in the background of complete silence.

EXPERIMENTAL STUDIES

Various experiments have been performed on various aspects of attention.

1. The experiments on the span of attention tell that (a) the power to apprehend does not increase with age, (b) but the capacity to combine units into more and more complex-wholes, increases. Prof. Spearman describes that every mind tends to keep its total output constant in quantity.

2. Experiments on the fluctuation of attention have made it obvious that we can not attend to any object continuously for long. Fluctuations are very rapid. The attention lapses every five or six seconds. It means that we attend in spurts.

3. Can we attend to more than one activity at the same time with the same interest and intensity? This problem has been studied experimentally and the answer is found to be 'no'.

4. Experiments upon distraction of attention have disclosed that distraction is generally harmful to the output of the work, but sometimes the individual rises to the occasion and draws upon the reserved energy.

5. Tachistoscope experiment, Proof-reading experiments and Inkblot experiments have disclosed that we attend to an object with a definite purpose according to a definite scheme. Every new object is attended and perceived in the light of the past.

SPAN OF ATTENTION

Attention is bringing an object into consciousness. The question arises how many objects can be brought to consciousness at a time. The answer of the psychologists is five or six i.e. we can not attend to more than 5 or 6 objects at one time. This is called the span of attention. In reading we can attend to several letters and words. That is our general observation.

This total output of the mind at one time is called the span of attention.

The span of attention with regard to vision is measured with an apparatus called Tachistoscope which exposes non-sense syllables to the reader for a very short period. The subject is asked to read and reproduce them. It has been found that he is not able to attend to more than six alphabets at a time. Thus, the span of attention of an individual is not more than six, i.e. he can not attend to more than six objects at a time.

One thing is worth consideration in this regard. We attend to these alphabets not separately one by one. We attend to them as parts of one single situation. Hence, it is said that we can attend to only one object at a time. The object may have a number of parts and details, but they all are attended to as one single unit. Thus, in attention , there is plurality in unity.

DISTRACTION

Shifting away of attention is called the distraction of attention. It is a sort of interference with the process of attending to an object. Loud sound, coming and going of men, magic feats etc. may cause distraction of attention in reading.

Conditions of distraction of attention are many. They include temperament of the individual and outside conditions of work like temperature, improper lighting conditions, uncomfortable seating arrangements and so on.

To overcome the distraction two things can be done. Either one may avoid the distraction-stimulus or he may become habituated to it. In the beginning the distraction is very strong. But when it goes on for some time and the individual decides to undermine it, it becomes less and less effective and some sort of accommodation takes place.

Sometimes, distraction reinforces the activity already going on i.e., it calls forth an additional mental effort to fix attention and persue a task. In this way sometimes very good results are achieved under conditions of distraction. When a distraction emerges as a challenge to the individual which is accepted by him, it may arouse greater enthusiasm and stronger will in him to overcome the same. During competitive examinations many candidates accept the challenge of distractions and put to more and more hard work.

APPLICATION IN EDUCATION

We know that the function of attention depends upon two conditions (a) objective and (b) subjective. The teacher, therefore, should stimulate those conditions.

OBJECTIVE CONDITIONS

Objective conditions of teaching cover the lesson itself, the qualities of the teacher, the class room conditions, methods of teaching etc.. All those should be improved and made appealing.

1. *The Lesson*

    (a) It should be vivid, graphic, picturesque and appealing.
    (b) It should be logically and psychologically arranged in proper sequences.
    (c) It should be lucid, simple, direct and clear.
    (d) It should be well integrated. All parts, headings and sub-headings should be organized into a compact single whole.
    (e) It should not be vague, dull and confused.
    (f) Its language and expression should be forceful and effective.

2. *The Teacher*

    (a) The teacher himself should be active, enthusiastic.
    (b) His own personality should be impressive, asserting and free from all sorts of mannerisms.

3. *The Class Room Conditions*

Such conditions as unhygienic class rooms, bad ventilation, unfavourable school surrounding cause distraction of attention. So they should be avoided.

4. *Methods of Teaching*

Method of teaching is an important factor in getting attention of the pupils. Methods of teaching should be :

(a) Suitable to the standard of the boys.

(b) New devices of teaching, such as visual aids, pictures, charts, models, etc., should be properly used.

(c) New methods of teaching such as Playway, Heuristic-method, Activity-method etc., should be intelligently tried on.

SUBJECTIVE CONDITIONS

Subjective conditions of the pupils should also be stirred. It may be done in the following ways :

1. Appeal must be made to the instincts, emotions, feelings, sentiments, ideals, attitudes, and purposes of the pupils. Interests of the boys should be unlocked. Various important instincts and sentiments such as instinct of Self-assertion, sentiments of Self should be properly tapped and stirred up. In this way non-volitional attention may be evoked.

2.(a) For volitional attention indirect interest must be attached to the teaching. This may be possible by making education purposive and related to life. In other words some goal must be set before the pupils.

(b) Interest in the lesson may also be created through sympathy and love of the teacher. Interest, of course is a never failing device upon which a teacher may always bank upon.

(c) Teaching should be woven round the hobbies of the pupils.

3. The teaching must be linked up with the apperceptive mass of the pupils, otherwise the lesson will go over the head of the boys.

4. Distraction of attention should be avoided by controlling conditions as such.

5. Fatigue should not be allowed to set in. If it has already set in, teaching should be stopped. Time table should take this into consideration.

6. Only one thing at a time should be done or taught otherwise, there will be a division of attention which will lessen the intensity of attention.

7. Span of attention is limited. So the lesson should be broken into smaller units.

QUESTIONS

1. Give the psychological nature of Attention and mention how it is determined.
2. What is an Interest? Discuss the relationship that tends to exist between attention and Interest.
3. In what way Interest and Attention differ from one another? What are various kinds of Attention?
4. Comment:
   (a) Attention is interest determining cognitive process, (Stout).
   (b) Interest is latent attention and Attention is interest in action. (McDougall).
5. How the knowledge of the psychology of Attention can be applied in teaching by the teacher
6. Write short notes on:
   (a) Distraction (b) Span of Attention.

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CHAPTER XII

SENSATION AND PERCEPTION

Let us now think of the senses that tell us about this vast world. The functions of the senses enable the individual to work his way among the objects of this burly world and acquire knowledge and skill.

We possess a large number of sense-organs for the reception of stimuli from the out-side world. These are also called 'receptors', each of which is sensitive to a class of physical events, such as lights and sounds and is able to translate the stimulation into electrical impulses. These impulses run along the sensory nerves to the brain. These sensory nerves form a system of 'connectors'. These 'connectors' carry impulses to the reacting machine which consists of muscles and glands, the 'effectors'. Thus the whole system consists of three parts :

(a) Sense-organs.
(b) Connectors—nervous system.
(c) Effectors—glands and muscles.

SENSES

There are five important senses, given below :

1. Sight. 2. Hearing. 3. Smell. 4. Taste. 5. Touch..

Psychologists also recognize many more. The sense of touch is very vague, as the sensations arising from the skin come from different sense-organs and give rise to very different sensations.

SENSATIONS

"Sensations are the conscious experiences aroused by stimulation of the sense-organs", e.g., sweetness, redness etc.. Sound sensations have pitch quality and intensity. Pitch is caused by a number of vibrations per second. The normal ear is sensitive to a great range of vibrations from 12 per second to about 25,000 to 30,000 per second.

Sensations are inner experiences aroused by the respective stimuli through sense-organs. Thus sensation takes place only when a special sense-organ is stimulated. We have the sensation of smell only when the sense organ nose is reacted upon by some stimulus like orange etc.. We can define sensations only with reference to our sense organs. Sensation is the response to a particular stimulus via our sense-organ. It arises within our organism. The stimulus reacts upon the sense organ which via various nerves, sends it to the brain-center. The brain-centre gives it a quality, the experience of which is the sensation. Thus, sensations are first registered in the brain. The sensation is the simplest and the most elementary form of mental activity.

SENSORY ADAPTATIONS

Senses have an adaptive capacity. One may feel a bad stench intolerable at first but after five minutes he may not notice it at all. This is called sensory adaptation.

AFTER SENSATIONS

The objects and the stimuli after they have once reacted upon the sense-organs, leave certain after-effects in the minds that float there, to and fro. These after-effects or after images are called 'after-sensations'.

Thus, senses are the gateways of knowledge, and sensations are the first impressions that the individual organism receives from the out-side world. All cognition originates in the sense-impressions. The training of senses therefore becomes very important.

SENSE TRAINING

The teacher, especially of the lower classes has a supreme duty to train the senses of his pupils. Sense training aims at :

1. The proper growth, sound health, integrity, and perfection of the senses so that their functioning may be smooth, exact and accurate.

2. To enable the pupils to transform sensations into imagination, thinking and reflection, and to enjoy the beauties of nature and art.

To impart such training and achieve these aims, the teacher should go ahead with object lessons and concrete teaching. Abstract teaching should be avoided. 'Learning by doing' is of great value. Importance of "Didactic Apparatus" of Maria Montessori, Kindergarten Method, Project Method, Excursions etc., lies in this fact of sense training.

PERCEPTION

MEANING

Perception is the earliest of intellectual activities. It is sensation plus understanding. Sensations are the raw material of perception. Sensations are the first reactions of the individual in concrete situations to the stimuli. Each one of us is imprisoned in the circle of his own sensations, but no experience is of purely sensation type. Only the experiences of the newly born baby may be said to be of a purely sensation type. Sensations immediately before the mind, are apprehended through 'schemas' (patterns) derived from past experiences. It means that the experience does not stop after sensations. It goes on and reaches a point when some kind of meaningful pattern emerges. Then it becomes perception.

Thus, perception is an "integration of sense-impressions into a meaningful pattern".

First, in the process of perception appear sensations, which may be understood as elementary experience. This is preliminary stage of cognition. Complicated experience or organised and meaningful experience is 'perception'.

Thus, perception is cognition at a higher mental level as compared to sensations.

Old psychologists considered perception to be a collection of sensations bound up together by the thread of a particular meaning. They defined it as the interpretation of the data, the present stimuli and the objects, in the light of the past experience and giving to it a new significance, a new meaning. Thus, according to old psychologists three elements are involved in the process of perception :

1. Presentative (objects present before the senses).
2. Representative (image of the past experiences).
3. Relational (establishing a relationship between the previous two).

Thus, every act of perception involves "a perception which determines interpretation of the present sensations and making them meaningful and significant."

Perception is the foundation of all higher forms of knowledge.

GESTALT PSYCHOLOGY AND PERCEPTION

A very great contribution towards perception has been made by the Gestaltists. Let us, therefore, describe Gestalt-psychology in details.

GESTALT SCHOOL OF PSYCHOLOGY

1912 is a turning point in the history of psychology. It saw emergence, recognition and eclipse of various schools of psychology. It saw the first announcement of the important school of Gestalt Psychology. This was founded by three German psychologists at Frankfurt. They were Max Wertheimer (1880-1943), Koffka (1886-1941) and Kohler (1887) new professor at Swarthmore.

Gestalt in German language means a shape. So Gestalt psychology means psychology of the shape. Each shape has its own quality and this quality is present in the whole not in its component parts e.g., notes of music and melody. This idea was developed by the Austrian philosopher-psychologist, Christian Von Ehrenfels (1859-1932). He founded an Austrian Gestalt School of Psychology. This School said that the quality of the shape or its pattern is perceived through a definite process which involves a higher mental operation. But this theory afterwards, was rejected by the German Gestalt School which said, "Higher mental operation is not required for organizing parts or components of an object or the situation." They said, "Sensations are self-organizing", "sensory field" as a whole is self-organizing. This is what Gestalt psychology means.

PERCEPTION ACCORDING TO GESTALT PSYCHOLOGY

The true nature of perception has been described and explained by the Gestaltists. They have discovered several laws which govern the process of perception. Most important of them are :

1. *The Law of Whole*

   This law says that whatever we perceive, we perceive as a whole. We do not perceive the situation or the object, element by element, or item by item into separate parts.

2. *The Law of Configuration*

   It means that we perceive the situation in patterns or configurations.

3. *The Law of Figure and Ground*

   It means that the situation is perceived with reference to a definite relationship between the "background" and the "figure". The whole field of the situation consists of a dominant event or the "figure" and a "background" with innumerable less significant events and objects.

4. *The Law of Pregnantz or the Law of Good Figure*

   It means that the whole tends to be as "good" and "stable" as possible, even if there are some irregularities in it and it is not complete. The mind tends to overlook incompleteness and irregularities. Even if incomplete, the nature of the picture is carried out as fully as possible. This is the "law of pregnantz".

Thus, perception is organization of different elements of a situation into a pattern, but the process is spontaneous. The organization takes place under three subordinate principles.

(a) The law of similarity.
(b) The law of proximity.
(c) The law of segregation.
} Law of Aggregation

APPERCEPTION

All perception is apperception. Apperception mass is one's past experience or knowledge. Apperceptive mass is the accumulation of past experiences. All the knowledge and experience acquired and preserved is one's apperceptive mass. Since the child is born in this world, every minute and hour new experiences and new knowledge are added to his life. It is on the basis of this apperceptive mass that he is able to understand the universe around himself.

Perception of situations and objects is based on this apperceptive mass of the individual. William James holds that apart from apperception, perception means nothing. It means that whatever we perceive, we perceive in the light of our past experiences. Perception is meaningful recognition of an object or the situation. But this meaningfulness emerges out of our past experiences. Thus, apperception makes the present experience significant and understandable.

This fact has a great bearing on education. In order to make a new piece of knowledge meaningful and comprehensible we must start with the related past experience of the child. Every new lesson must be based on the previous knowledge of the child. We can not make the child of class VIII understand and assimilate higher laws of Mathematics as it is not related to his past knowledge.

Elements that are similar and elements that are close to one another tend to combine and make a configuration; and elements that are unlike and far apart remain separate. Wertheimer calls these "field forces" or "principles of organization". Wertheimer groups all these laws and principles into three factors :

1. *Peripheral Factors*

These factors which are present in the figure and the ground and its elements, are similarity, proximity and segregation.

2. *Central Factors*

These factors originate in the organism of the individual. They are 'familiarity' and 'set'. They refer to a condition of the individual's being familiar with certain pattern or to be ready to see in the object the definiteness of some pattern.

3. *Reinforcing Factors*

These refer to the law of "good-figure", when some pattern begins to emerge. Past experiences and other factors that reinforce full perception come under this heading.

Thus to the Gestaltists, the situation and its background form a "dynamic field" a "physical reality". It is "molar" and so experience also is "molar".

"The organism responds to the patterns of stimuli" and this response is "a unitary process, a functional whole, a sensory scene" and not a "mosaic of local sensations".

PERCEPTION IN READING

The same laws of Gestalt psychology apply to the process of reading. We perceive words, phrases and even sentences as a whole. We do not pay attention to the individual letters.

In reading, the following types of eye behaviour are noted :

(a) Fixation.

(b) Saccadic movements from one fixation to another.

Photographic records of eye movements in reading taken by Dearborn show that the eye jumps from one spot to another. It fixates at one spot and then jumps on to another. It is during these fixation period that the eye sees. During the jump nothing is seen.

Sometimes there are 'regressive movements', movements of the eyes within a line, going forward and backward.

HOW TO IMPROVE READING

For improvement in reading the teacher should pay attention to the following points :

1. Number of fixations in a line should be lessened. Ability to grasp a wider unit of material in one single fixation should be developed.

2. The duration of the time of fixation should also be shortened. This may be possible when the material is easy and it does not contain difficult words.

3. Regressive movements should be checked.

4. Eye-voice-span should be increased. For this purpose material should not contain difficult and ambiguous words.

OBSERVATION

Training in observation has its importance in education· Hence, it becomes necessary to discuss the psychological nature of observation. Observation is perception. Yet it is not merely perception. It is more than perception. It is not perception without aim. It is perception with a definite aim. Thus, observation is "regulated perception". In the words of Sully it is to look at a thing closely, to take careful note of its several parts or details." Perception is unplanned. In observation there is planning and high degree of concentration. When we move in the garden we perceive a number of flowers and experience joy. But that is not observation. But when we approach every flower with a definite aim and note its colour, the quality of fragrance, smoothness, shape and size with a definite end in view, that is observation.

Several things are involved in observation. It involves reflection, thinking and reasoning. It moves within the mind along with certain ideas. Attention, selection, analysis, classification, etc. are the steps that are involved in observation. In observation, we note the points of similarity and of discrimination. Thus observation is planned perception.

Training in observation is very important as observation is necessary for active and dynamic living. It is helpful in enabling the child to make better adjustment in his world.

Superiority in observation depends upon three factors.

The first is the full awareness of the situation. This is achieved by coming into contact with the situation again and again. Thus, the second factor is the repeated experience of the situation. Thirdly, attention and interest also govern one's observation. We observe those things quite minutely in which we are interested. Things in which we are interested are attended too keenly.

Hence in order to train the pupils in observation, we must enrich their life with variagated interests. Things which have greater significance should be brought into their contact repeatedly.

ILLUSIONS

Perception is the right interpretation of the sensations. Illusion is the wrong interpretation of the sensations. An illusion is a false perception. Drever defines it as "a subjective perversion of the objective content of sense perception." Collins and Drever have classified illusions under three heads :

1. Illusions of reversible or ambiguous perspective.
2. Illusions of extent or distance.
3. Illusions of direction.

IMPORTANCE IN EDUCATION

We have seen that psychology of perception helps the teacher most in the task of improving reading ability of his children.

Besides, it emphasises the role of environment in which education has to take place. Things, knowledge, skills, ideals and virtues that the teacher wishes to impart to his pupils should be made dominant in the background of the whole environment. If virtues and ideals are to be learnt they should be actually lived and appreciated in the environment in which the pupil is being educated. Thus the teacher has to take into consideration the background forces as well as the dominant figure events of the environment. The teacher should see that the background forces are not running in opposite direction to the figure-events, things that are aimed at in education. This is very important for fashioning a right type of personality and high character.

It also emphasises the roll of the apperceptive mass of the individual. Knowledge, skills, and ideals learnt by the pupils in their school life form a part of their apperceptive mass when they leave the school and enter into practical life. In the light of the apperceptive mass they have to interpret the world and their immediate experiences. An intelligent comprehension of the world and the surrounding environment, therefore, is contingent upon the formation of a right type of apperceptive mass. The teacher bears a great responsibilty towards this.

QUESTIONS

1. Define 'sensation' and mention why the training of the senses is important in education.
2. Explain "sensory adaptation" and "after-sensation" and trace the relationship between Sensation and Perception.
3. What is Perception? Give the contribution that Gestalt Psychologists have made towards Perception.
4. What are various laws and principles of Gestalt Psychology? Discuss the Phenomena of 'Perception in Reading'.
5. What is Perception according to Gestalt Psychology? Discuss its importance in education.
6. How can a teacher improve Reading of his pupils?

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CHAPTER XIII

LEARNING

GENERAL NATURE OF LEARNING

Learning is the modification of behaviour through experience and training. It is, therefore, growth, a developmental process.

The need arises, goal is set up, adjustment begins, changes in behaviour take place and stabilize. This whole process is learning.

Learning involves problem-solving i.e., understanding and discovering relations between different contents in a situation.

Learning is an activity aroused by the personal and social demands. Why should one learn? Because, it is the demand of the individual himself; it is the demand of the society. But the individual may learn things both desirable and undesirable. The task of education is to enable the individual to learn the desirable and eliminate the undesirable. Thus, learning is a process of improvement.

Learning is a change in behaviour-organization. It is the organism as a whole that learns. Bode remarks, "Learning as reconstruction, combines thinking, skill, information and appreciation in a single unitary process; and it is characterized by flexibility, since it must constantly adapt itself to the circumstances of the situation and the environment."

Thus, the child in the school learns Arithmetic etc., and gradually finds himself, totally a changed man. That is why in democratic countries they hold that education is a great force which can transform man. The child in the school learns a sense of personal worth; and his whole self is changed. Therefore, the teachers should remember that they are dealing with the pupils as a person never with just a piece of them, at a time.

VIEWPOINTS IN LEARNING

Psychologists distinguish certain modes or types of learning. Important of them are :

1. Imitation.
2. Trial and Error, (Connectionist viewpoint).
3. Learning by insight, (Gestalt view).
4. Conditioning, (Behaviouristic view).

IMITATION

Much is learnt in life by way of the method of imitation. Children imitate to a great extent in learning of new things. Presence of this tendency is one reason why children can learn so many more new things, much more complex ones, and so much more quickly. Children usually attain their first approximate success through imitation. Animals can only succeed through repeated unguided trials. But an exception to this rule is found in the imitation of sounds reproduced by parrots and some other birds.

Imitation may be conscious or unconscious. In teaching skill, writing, posture, figuring, the correction of speech, pronunciation, etc., the teacher makes use of imitation. Through unconscious imitation, the customary behaviour and moral code of society are learnt and made permanent part of the child's character. The conduct of the parents, the personality of the teacher, literature, the ethos of the school-environment, the "movies", all are very effective models for imitation. Fashion and customs are largely through imitation.

Thus, imitation is an important moral, intellectual and social agent in formal education and throughout life. But in learning of newer and more complex things imitation plays little part.

TRIAL AND ERROR

This is also known as "learning by selection of the successful varient." When no ready-made solution of a problem is available to the learner, he adopts the method of Trial and Error. He first, tries one solution. If it does not help him, he rejects it. Then, he tries another and so on. In this way he eliminates errors or irrelevent responses which do not serve the purpose and finally discovers the correct solution. Thus, in Trial and Error method, the learner makes random activities and finally reaches the goal accidently.

One thing should be remembered that in Trial and Error also, there are often systematic and relevent responses. Activities are not wholly random. All these activities though apparently random are suggested to him by the situation and the learner proceeds on accordingly. The following are the stages through which the learner has to pass :

1. Goal.
2. Block (hindrances).
3. Random Movements or multiple response.
4. Chance-success.
5. Selection.
6. Fixation.

EXPERIMENTAL STUDIES

Various experiments have been performed on men as well as animals to study this method. Thorndike made several experiments on rats and cats. Gopalaswami's Mirror-drawing experiment is very important.

In this Mirror-drawing experiment the subject is asked to trace a star projected in the mirror. The experimenter observes the movements of the hands and, thus, records the time of tracing in successive trails and the number of errors committed in each trial. Gopalaswami analyses the errors into two groups—lower-level errors and higher-level errors.

Those errors which do not involve any noble process on the part of the subject in tracing the star are lower-level errors and those which involve higher process of mind on the perceptual and conceptual level are higher-level errors.

Gopalaswami discovered that improvement in the higher-level responses correlated highly with intelligence and that the improvement in the responses of the lower-level errors did not show much correlation with intelligence.

ITS LAWS AND PRINCIPLES

By way of experimental studies, Thorndike discovered three major and five minor laws. Later experiments with human subjects caused him to add one more. Thus, they are :

MAJOR

1. Readiness.
2. Exercise.
3. Effect.
4. Belongingness.

MINOR

1. Multiple Response.
2. Attitude or 'Set' or Disposition
4. Assimilation.
5. Conditioning.

1. *The Law of Readiness*

This may cover "Set", "attitude" or disposition. It means a state of readiness or inner 'drive' to learn. The learner must be made ready to learn. This is the law that is implied in the introductory part of every lesson. Unless the learner is ready to learn nothing can be taught.

2. *The Law of Exercise*

It means that efficiency and durability of learning increases with practice and exercise. This is also known as "the Law of Use" and its opposite "the Law of Disuse". Many examples of this are found in case of human learning. Learning to drive a motor-car, typewriting, singing and music etc. need exercise and repetition of various movements and actions many times. In the same way it is very necessary to repeat the elements of the task in correct order regularly if we want to memorise a poem or a mathematical table.

But, this law has been severely criticised on the grounds that it does disregard other factors such as motives, interests, special training etc.. Mechanical repetition without motive, interest, significance or understanding does not make anyone learn anything and remember it. One rupee-currency note passes hundred times through the hands of a person, but hardly anyone is able to tell the size, the colour and other details of it. A boy was asked to write hundred times "I have gone" after school. He wrote it mechanically and correctly all the times. But when he left the school in the absence of the teacher, he wrote "I have written", "I have gone" correctly one hundred times and since you are not here "I have went home." After repeating one correct thing so many times he again committed the same mistake. This shows that repetition without motive, interest or understanding is of no avail.

The above law of Thorndike covers several other subordinate principles, such as Frequency, Recency and Vividness. The principle of frequency emphasizes that an activity or situation of learning in order to be effective should be repeated again and again. But is does not mean that improvement occurs at all occasions. A time comes when in the long run no improvement takes place. Recency means that things recently learned are less subject to errors than those unpractised for sometimes. The negative side of this is the law of disuse. Vividness or Intensity means that active and interesting things are better learned and remembered than passive and uninteresting ones.

3. *The Law of Effect*

It signifies that if the responses satisfy the subject, they are learnt and selected, while those which are not satisfying are eliminated. Teaching, therefore, must be pleasing. The educator must obey the tastes and interests of his pupils. In other words greater the satisfaction stronger will be the motive to learn. Thus intensity is an important condition of the law of effect.

To make one situation effectively conducive to learning, it is necessary to make the end effect satisfying. Prizes, medals, the honour-roll and other forms of approbation are some of the traditional ways in which the school has utilized the law of effect. In the same way to modify the undesirable behaviour of a child, social disapproval, withholding of something valued or desired, punishment, substitution of satisfying interests are the common methods employed.

To sum up, modification of behaviour is a fundamental problem in the psychology of learning and such modification usually involves the principle of exercise and effect.

4. *The Law of Belongingness*

The Law of Effect which previously meant that annoying things are not learnt and satisfying responses are learnt was modified by Thorndike as a result of his later researches. He realised that annoying experiences too are remembered equally or nearly well. We do remember experiences that are painful to remember. Thorndike then explained this anomaly in terms of belongingness. He said that things are "recalled not in isolation", but in patterns or associative complex to which they belong. They are recalled as they are connected with other items in the complex. The connection between the goals and things to avoid may be quite as strong and enduring as are the connections between the goal and things to do. This is learning from the connectionist viewpoint.

SIGNIFICANCE IN EDUCATION

Learning by Trial and Error is not of very much use and should not be resorted to by the teacher as it lays an stress on cramming.

There is much wastage of time and energy in learning by this method.

Yet, there are certain subjects such as Mathematics, tables of Mathematics, memorising poetry, rules of grammar etc., in which learning by Trial and Error can not be avoided. All "reasoning subjects" afford the greatest opportunity for the application of the Trial and Error Method.

LEARNING BY INSIGHT

MEANING

This is Gestalt-viewpoint. According to this view "learning is the organisation and reorganisation of behaviour which arises from the inter-action of a maturing organism and its environment. It is the bringing about, through this inter-action of new forms of perception, imagination, motor co-ordination and other organic behaviour." Sudden appearance of the solution is an essential characteristic of insightful learning. "A sudden coherent pattern of solution appears at once." The individual does not perform random activities, but he perceives the situation as a whole, and intuitionally reaches the goal through awakened insight. "Insight is the perception of a relationship between at least three factors, an agent, a goal and intervening conditions or obstacles."

ITS PRINCIPLES

The learning by insight has three principles—the principle of insight, the law of whole and sudden appearance of the solution.

EXPERIMENTAL STUDIES

A number of experimental studies are at our disposal due to the efforts of Koffka and Kohler. Kohler performed an experiment with six chimpanzees. He kept the animals in a room, suspended a bannana from the ceiling, put a box into the middle of the room and placed a stick near by. All the six animals leaped repeatedly, but could not get the bannana. One of them the Sultan after surveying the whole situation got the box under the bannana, picked up the stick, jumped over the box and got the bannana. In this way a number of experiments were performed.

Another experiment is learning by the substitution method. A series of alphabets and a key with a particular number to correspond with a particular alphabet are provided to the subject. He has to proceed substituting numbers for the alphabets for thirty seconds after which there is a period of rest for thirty seconds after each trial. In this way he has to work in twelve periods and takes rest for another twelve periods. In this kind of learning a typical curve is, thus, obtained with gradual and steady increase in the rate of substitutions with plateaus interspersed in between. Sharp rises are very rare because the subject has not very much occasion to apply his insight and to hit upon devices that quicken the process. This is learning at a perceptual level as it makes much use of memory of ideas.

IMPORTANCE IN EDUCATION

This type of learning is very important in education because it discards memoriter-type of learning. It does not consume much time.

It emphasizes upon meaningfulness, organization, and integration of the lesson. The lesson should be logically organized into a meaningful pattern.

It trains imagination, reasoning and thinking abilities.

A major point in this learning is that initial insight is only instinctive and automatic. This insight can be brought about through maturation, experience and good arrangement of the environmental forces. The teacher must postpone the task until circumstances are more propitious. If, for example, the child is unable to appreciate a poem, no amount of analysis into metres, rhymes, schemes, grammatical constructions, similies will supply the want. Details must always follow general grasp or vague emotional insight. In the same way development of accuracy, precision and detailed skill should always follow, never precede general orientation and insight.

Learning by insight emphasizes, therefore, teaching by means of encouraging, aiding and directing behaviour. This aspect of teaching is also called for by Prof. Dewey and those who advocate "creative acitivity" and "the Project Method".

LEARNING BY CONDITIONING

MEANING

This is learning from the behaviouristic viewpoint. According to this viewpoint learning is "formation of conditioned reflexes" or "acquisition of involuntary anticipatory adjustment" or "a habit formation" so that behaviour may become automatic.

By "anticipatory adjustment" he means "organic behaviour" which is "not complete" but "with a gap in the whole equilibrium pattern" for example, hunger in which saliva gastric juice, function of the stomach etc., are the organic behaviour with a gap and so incomplete. It becomes complete when the object of hunger is obtained.

Importance of anticipatory adjustment is very great because:—

1. It is the foundation of all voluntary behaviour.
2. It is active desire that sets the goal and makes the organism strive.
3. It determines the "mind-set" or "organic pattern of eadiness".

Unless this organic pattern takes place within, no real learning can appear.

If we can control this anticipatory adjustment we can also control learning. This controlled learning is the conditioned learning. In this the thing to be learnt is termed as 'cue stimulus', and this is then followed by a satisfying stimulus. This combination is repeated again and again and ultimately the learning of the 'cue stimulus' is established. This is conditioned learning.

Generalization

Conditioned learning is also accompanied by a generalization of the experience. For example, a child whose fear is conditioned to a white rat also begins to fear a rabbit, cotton, wool, a white fur-coat and other alike objects.

Deconditioning

When the same process is repeated again and again for a long time, after the conditioning has taken place it produces adverse effects. The conditioned S—R becomes extinguished. For example, repeated exposure of the rat may gradually reduce the fear after it has been conditioned.

Experimental Studies

Pavlov's experiment is noteworthy in this field. He took a dog, kept him in a room, sounded a bell and immediately after this gave him a piece of meat. This process was repeated for several days with the result that ultimately only the sound of the bell was enough to cause saliva come out of his mouth. The dog learnt fairly well the meaning of the sound of the bell.

Watson performed experiments on rats in which fear was conditioned to the rats in case of a child named Albert.

In an another experiment 8 infants were conditioned to feeding response when a loud sound was produced. They were taken when only 24 hours old. Seven of them showed significant changes in 3 to 6 days. So a newly born baby can also learn through this process. This experiment shows that conditioning does not require brain functioning.

Its Principles

Its success depends upon the following principles :

1. *Time Principle*

It means that there should not be a wide gap of time between the cue stimulus and the satisfying stimulus.

2. *Principle of Intensity*

It means that the satisfying stimulus should be of great intensity otherwise it can not produce the desirable organic behaviour.

3. *Principle of Consistency*

It means that the same process should be repeated in the same way without any change for several days.

4. *The Situational Principle*

It means that the situation or the surrounding in which learning is to take place should be such as there may not be in it chances of distraction.

5. *Principle of Repetition*

It means that repetition is necessary for reinforcement and fixation of learned response.

6. *Principle of Inhibition*

Inhibition should not be allowed, i.e. there should not be allowed any factor or situation that inhabits learning.

IMPORTANCE IN EDUCATION

Many things of the school-subjects are learnt more adequately through this process. Reading, writing, spelling or habits, subjects are learnt more effectively through the process of conditioning. Direct Method of teaching English is just a process of conditioning. We learn many things in a better way through this process; and that is perhaps the reason why language is more efficiently learnt by living in the society in which it is spoken. Teaching through visual aids also implies the same principle.

Discipline may also be caused through conditioning. Good sentiments, good habits, virtues and ideals etc., which are the components of discipline are effectively learnt through the process of conditioning; and they are learnt surely, in a society in which they are actually lived and manifested.

Class-room procedures are often far removed from the natural procedures required for the process of conditioning. Languages are not taught as they ought to be in connection with many vivid and widely different experiences.

If the regulations, commands and virtues are followed by the friendly behaviour and the most sympathetic attitude of the teacher, he can bring about a compliant emotional tone in the class that no amount of punishment can accomplish. But uniformity of procedure is essential.

Voluntary action may be controlled through reasoning, punishment and reward, but if its involuntary basis is neglected it will not endure. In conditioning involuntary responses are controlled through the cue stimuli.

Many of our fears and phobias may be traced back to some kind of conditioning. When things and objects associate with an unpleasant experience and a sort of generalization is made, phobias appear. Such fears and phobias can be removed by deconditioning.

The conditioned response theory may also help in explaining many of our repugnances and unexplained reactions to people, places and things. Such conditioning often takes place in childhood, and though the real causes are not known the effects remain. In this way many of our reactions are not natural but simple causes of conditioning.

THE GENETIC VIEWPOINT

The genetic viewpoint uses material from all other fields, but is different from them all. It gives seven stages of learning—Orientation, Exploration, Elaboration, Articulation, Simplification, Automatization and Reorientation. In orientation the problem is recognized in "agent-goal-obstacles-relationship". Exploration is the approach, elaboration the extensive examination and articulation the integrating of the elaborations with those which arise from the other observations. Simplification is the elimination of reactions to other cues. Automatization takes place when reactions to the cues become reflexive. Reorientation is the solution of the problem.

Each of these viewpoints has some truth, but no one affords complete satisfactory theory of learning.

CURVES OF LEARNING

MEANING

Learning involves acquisition of material. Acquisition is not sudden. It progresses steadily and sometimes acquired material disappears from the consciousness. Thus, acquisition and forgetting both go side by side. All these activities—acquisition, retention and forgetting—can be measured graphically. Graphic representations of the progress and rate of learning, rate of forgetting and retention are termed as learning curves.

THEIR TYPES

The following types of curves are most commonly found :

1. *A Straight Line*

This represents a constant rate of improvement.

2. *A Negatively accellerated (Convex) Curve*

In this there is a rapid initial rise and this initial rise gradually lowers down and the curve ultimately becomes a straight line or plateau. This is also called logarithmic type of curve.

3. *A Positively accellerated Concave Curve*

In this, there is a slow rise in the beginning and this initial rate gradually increases.

4. *A Combination-Curve*

A combination of the (2) and (3) with intervening plateaus.

In the beginning, generally, the progress is slow. But sometimes it has been discovered to be suddenly rapid. But rapid in the beginning does not always mean better learning and a higher degree of learning capacity. This may be due to:

1. The utilization of previously acquired reactions.

2. Acquisition of broad patterns of the new performances.

3. Mastery of those phases which help in the learning of the activity.

4. Initial enthusiasm.

PLATEAUS

MEANING

Plateaus are the prominent features of all learning curves. Sometimes, it so happens that after a slow or rapid rise no progress made for a considerable period and the acquisition remains the same. This period of constancy of acquisition or improvement is represented by the curve in the form of a straight line. This is known as plateaus. After sometime the learner may again begin improving and in the curve there will be, again, a rise after the plateau. After this rise, again there may be a period of no progress for sometime. In the way the learning activity runs ahead until, finally, there comes up a point at which progress stops for ever. These interpersed periods of constant improvements or no progress are called plateaus.

REASONS

Why do these plateaus occur? The reasons are :

1. Undue attention to one part of the task which disturbs co-ordination of responses resulting in a deadlock of progress :

2. Shifting of attention from one phase of performance to another e.g., from speed to accuracy.

3. Transfer of errors from one part of the activity to another. For example a student makes rapid progress in statistics in the beginning, but soon after he reaches the actual complicated problems, his progress stops, as his errors committed in calculation and weakness in adding, subtracting etc., are transferred to the real activity.

4. Lack of balance among various phases of a complex skill. If all the stages of a lesson-plan are not balanced progress may be effected adversely.

5. Ineffective methods of work. If the method of teaching is not effective, progress may stop for sometime and plateau may occur.

6. Failure of practice with consistent method. At one time one method is used, while at another time quite a different one. This practice also sometimes, results in plateaus.

7. Sometimes, plateaus are periods of preparation for a higher integration, "hierarchical organization" or acquisition of higher responses and more complex ones, e.g., organization of words into phrases.

8. Lapse of interest and enthusiasm in the activity.

9. Inappropriate habits, fatigue and the like may also cause plateaus.

The plateau is not a universal characteristic. Short-time and day-to-day ups and downs are practically universal. These may be due to temporary bodily condtions and lack of intorest etc.

IMPORTANCE IN EDUCATION

Learning curves are of great value in education.

1. They give a rough generalization of the rate of progress, the regularity or irregularity of progress and the relation of progress to increasing difficulty of material.

2. Learning curves help the teacher in knowing where his pupil stands as regards the progress in learning. They may tell him where lies the weakness in learning and what are the difficulties of the pupils.

3. An outstanding contribution of these curves is the discovery of plateaus by Bryan and Harter. Discovery of a plateau through a learning curve may at once tell the teacher that the pupil is facing some difficulty and the progress is blocked. He may, then, try to find out the reason of this and then remove this. Thus, plateaus enable the teacher to know the short-comings of his teaching as well as the difficulties and weaknesses of his pupils. Knowing this, it becomes easier for him to adjust his teaching accordingly and achieve maximum success.

LIMITS OF LEARNING

By the limit of learning means "the attitude of one's power to do a certain work".

Each person reaches a limit in practice or learning which is below his actual or 'physiological' or 'theoritical' limit. This is known as Practical Limit. Very few reach physiological limit. Mostly, people reach the practical limit.

Between 'theoritical' or 'physiological' limit and the practical limit lies the 'Optimum' Limit. This is reached by efficient work-habit and by the most efficient management of time and efforts.

Optimum Limit consistent with good emotional adjustment hould be the aim of the teacher. Many are below it. Tey sshould be stimulated.

LEVELS OF LEARNING

In case of every activity, learning takes place at three levels. They are:

1. *Primary Learning*

When the pupils learn only the bare skill or the bare facts of informatoin, e.g., Akbar's Rajput Policy (bare learning.)

2. *Associate Learning*

When the pupils also learn skill and activities related to the main activity, e.g., Akbar's Rajput policy and its effects upon other aspects.

3. *Concomitant Learning*

When certain attitudes, mental dispositions, ideas and appreciations etc., are learnt which may transfer to other situations of life. This kind of learning is the outgrowth of the main activity of learning. In democracy this form of learning is of great value and significance.

METHODS OF LEARNING

What is more important for the teacher is how to study. The objective here is economy of time and effort in the mastery of material and retention of what has been mastered. Following are the most important methods:

1. *The Whole Method*

By the Whole Method means that the general nature of the material should be apprehended first. This method is in accordance with the Gestalt 'principle of whole'. It says that the whole material should be learnt as one single unit. It avoids the formation of needless bonds and thus saves time. But this method is fruitful only when the material is of reasonable length. What a reasonable length is, depends upon the possibility of securing a central idea or unit of thought.

2. *The Part Method*

In the Part Method the material is divided into parts and each part is learnt separately. Then, they are repeated together to make a whole. This method has one advantage. It is this that the child easily masters one part and when it has been mastered, it gives him some sort of satisfaction which works as an incentive for further learning. It has several disadvantages, too. Firstly, more time is wasted and secondly, needless associations are formed.

3. THE MIXED METHOD

In this the subject first starts with the 'whole method'. He reads the whole of the material first, and then discovers the portions that are more difficult. Then, he masters these difficult portions. After this when the whole of the material has become homogeneous, he again starts with the whole method. Thus, he learns with the help of both the part as well as the whole method.

4. THE PROGRESSIVE METHOD

In this method the material is broken into several units. The learner, first, masters the first unit separately and then the second. Then, he repeats the first and the second both together. After this, he learns the third separately and then repeats all the three units together combining them into one single unit. In this way he proceeds until the whole task is over. This method is superior to all other methods.

No method can be universally accepted as the best method. It all depends upon the age, physiological and psychological conditions of the learner, type of the material to be learnt and other conditions of learning as to which method should be used. The teacher should take an account of all these factors and then determine the method accordingly.

SELECTION AND ARRANGMENT OF MATERIAL FOR LEARNING

There are two views regarding the arrangement of the material to be learnt. Accordingly, therefore, there are two types of learning—logical learning and psychological learning.

LOGICAL LEARNING

It means learning of the material which is arranged in a logical order. In other words when the material is organized on the basis of chronology, casual relationship of its various parts, sequence-order, maxims such as 'simple to complex' etc., and serial order of the coordinate and subordinate units linked up with the central idea, we give this systematization a name of logical learning.

Logical learning is usually associated with formal and systematic teaching. It is the product and the characteristic of the old school with its more formal methods.

PSYCHOLOGICAL LEARNING

Psychological learning does not emphasize the logical and systematic organization of the subject-matter, although it is not inconsistent with it. Its stress is upon the subjective conditions of the pupils. It takes into consideration the inner tendencies, needs and urges, interests, purposes and motives and other inner impulses of the learner. Its criteria of arranging the material are the psychological factors. Psychological nature of the child is the most prominent feature in the determination of the psychological learning. Abilities and capacities of the pupils, characteristics of the stages of development, attitudes and ideals, motives and readiness of the learner are some of the aspects that are taken into account while arranging and selecting material to be learnt.

Psychological learning is the outcome of the new tendencies in education. It is the keynote of the new education. It is a corrolary of the "Paido-centric" tendency or "child-centred" education. Basic education, Project method, Montessori method, Kindergarton etc., all the recent development in educational practice are based upon psychological learning.

The psychological method of approach is now, widely preferred to the logical method. Thus, selection and arrangement of material, in such subjects as spelling, reading, arithmetic etc., should be guided by the factor of utility and the life-situation. The child should first learn the words that he needs in his practical life. The adolescent boys and girls like adventurous fictions and stories. This may be used as a motivation ready-made. By an intelligent selection of material according to the principles of tastes, interests and likings of the pupils a lifelong taste for good reading may be developed.

In psychological learning methods of teaching, too, demand a radical revision. Teaching of various subjects in isolated forms should be replaced by occupational activities carried on in a social setting. Projects from life-situations should be selected and presented before the boys. Five steps appear in the essentials of method—Experience, Problem, Data, Hypothesis, Testing.

Thus the whole of the new education is psychological learning and psychological learning is the focus of new education.

QUESTIONS

1. How will you define learning? Give an account of various theories that explain the phenomenon of learning.
2. What do you understand by "Trial and-Error-Learning". Mention about its importance in Education.
3. What are various laws and Principles of Learning expounded by Thorndike? State how far they can help the teacher in educating his pupils.
4. What do you mean by "Learning by Insight"? Show its importance in Education.
5. What is "Learning by Conditioning"? What is its importance in Education?
6. What are various principles of 'Learning by conditioning' and how they can be applied in education by the teacher.
7. What are curves of learning and what is their utility in education?
8. What do you understand by 'Plateaus of Learning' What are their causes?
9. What are various methods of learning? Which method is the best? Can you tell?
10. How will you explain Logical' and 'Psychological' learning? How will you apply them to education?

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CHAPTER XIV

MEMORY

Earlier psychologists defined memory as "a revival of ideas in so far as such revival consciously reproduced a previous experience without transforming it." It is, therfore, a "conservation of experience so that the past effects the present actions." But it is used in a limited sense meaning that we remember something in particular and do so with more or less of an effort.

Sir T. P. Nunn and other Hormic psychologists believe that the mind is gifted with a great power Mneme, the power in virtue of which the past is retained. But Mneme is not memory. It is a wider term than memory. "Memory is Mneme risen to the level of apprehension."

What is thoroughly learnt, is remembered. Learning, therefore, is fundamental to memory. But, in addition to this it has three more phases —retention, recall and recognition. Thus, the whole process consists of the following four phases:

1. Learning Acquisition or Impression.
2. Retention.
3. Recall or Reproduction.
4. Recognition.

Learning is mere acquisition of the material, the formation of connections which make recall possible. In a complete act of memory, all these three aspects are clear. But we, often, fail in the third, 'the recall', while the first two, acquisition and retention are operative. This is complete memory.

Disorders and abnormalities are found to occur in one or more of the four phases, while the others remain comparatively undisturbed. Injuries to some portions of the brain may cause disorders of retention. Disorders of recall occur in hysteria and emotional shock. Thus, the division of the whole process into four separate aspects is justified.

KINDS OF MEMORY

Memory has been classified into various kinds. They are:

1. Immediate Memory and Permanent Memory

When the material learnt is recalled immediately after it has been learnt, it is called immediate memory. When after learning, sometime is allowed to lapse and then the material is recalled, it is called permanent memory.

2. Personal and Impersonal Memory

In personal memory personal past experiences are recalled. In impersonal memory, facts are remembered without any reference to personal experience. It is a personal memory to recall my first-day experience at the D.A.V. Training College. Kanpur. When I recall in the examinations what I have to write, is impersonal memory.

3. Rote Memory and Logical Memory

Rote memory is mechanical repetition of the material until it becomes automatic. It does not care for meaning and understanding. Memorizing a poem by repeating its lines again and again without understanding its meaning is rote memory. In logical memory meaning and understanding are essential elements. Organization of the material that makes assimilation possible is an important aspect of logical memory.

4. Passive and Active Memory

In the passive or spontaneous memory, past experiences are recalled without any effort of will. The stimulus 'Allahabad University' reminds me immediately of my teachers, my department, quality of lecturer and so on. It is passive memory. Then an effort of will is applied to the act of reproduction, it is active memory. Active memory is just the recollection behind which lies the force of deliberation and conscious effort.

5. Memory of Sense-Impressions

If we take into consideration the impressions produced by various senses and their retention we get auditory memory, visual memory, tactual memory, olfactory memory and so on.

6. HABIT MEMORY AND TRUE MEMORY

Habit memory is the same as rote memory. In the habit memory "various repetitions are consolidated into a single quasi-mechanical set of movements" and they are recalled in the same order. It may be called "habit enlightened by memory" or "physiological memory". In this, facts are acquired by dint of repetitions. We achieve a language-habit of reciting words. We may or may not be knowing the meaning of words, but we can remember and repeat the sounds in their correct order.

This distinction between habit memory and true memory was drawn by Bergson to explain the nature of soul, a problem of metaphysics. But it has been carried over to education.

Education in the past has relied exclusively on the habit memory, for example, children were asked to learn dates and events in history, capes, rivers and mountains in geography by mere repetition and testing until they could repeat them by rote. Present education discards habit memory and learning by rote. Yet, the teacher cannot completely cut away from this. In learning arithmetical tables, habit memory cannot be avoided. In language, also large part is played by habit memory. In learning vocabulary and spelling habit memory is of great use. Therefore, the question is not of abolishing habit memory, but of devising conditions under which it can work most successfully. These conditions are :

1. Repetitions should be rhythmical e.g., to remember the days of months we have "thirty days have september......etc". Rhyme and rhythm fix the words in the mind.

2. It should be frequently tested by the recall or reproduction.

3. Improved methods of handling the material.

4. Fatigue should be avoided.

5. Spaced-revisions should be made.

6. Whole method should be used.

True memory or pure memory or psychological memory has different characteristics. It involves self-consciousness and in it the recall has a definite date, place and setting. In it the individuality of the learning process is not merged. Bergson names this as "immage-memory". To him true memory is represented in its setting and is reproduced piece-meal. It may be revived as a whole in a single act of intuition.

Charles Fox objects to Bergson's naming of true memory as "image-memory" on the ground that it excludes the possibility of imageless rememberance or memory of meanings without images.

In true memory acquisition is not a mechanical action like that of habit memory. The temperament, attitudes, interests etc., of the learner determine the content of what is acquired. Thus true memory is a living process.

True memory can be explained by biology (inner urges, need and drives) and not by mechanics.

True memory is not mere reproduction; for processes of condensation, elaboration and invention are happening in the interval making the act one of reconstruction rather than the re-excitation of lifeless permanent traces as is the case in habit memory.

In true memory, past experiences have a permanent effect on our thoughts and actions even though conscious recall may not be possible.

In the true memory, will or desire is the essential determining factor. This emphasizes the factor of natural motivation. For the true memory, it is necessary that the materials to be presented should be meaningful. Pure or true memory depends upon associations and interests of the learner. The following are a few conditions under which true memory can be made more effective and successful :

1. Material should be meaningful. It should be within child's experience to be comprehensible. It should be conveyed in a language which is within their understanding. Model reading and comprehensive test questions in a lesson of poetry are important for this reason because they give pleasure of recognition.

2. All parts of the material of the lesson should be well integrated. Pure memory depends on association. So there should be a proper connection between all parts and elements.

3. Proper interest should be aroused in the material before it is learnt. If there is no interest, all the information gained will slip out of the mind.

Thus, habit-memory may retain any action whatsoever and is in the nature of a tool rather than a direction power of the mind. Pure memory working by meaning and selectivity is well-adapted for carrying out purposes. The meaning of a situation is important for subsequent action in pure memory. We remember only purposeful events and so forget something purposely, "otherwise our mind would be an over-crowded museum".

One who learns readily retains important things permanently, and keeps them readily accessible for the needs of the moment, has a good memory.

RETENTION AND FORGETTING

Retention is the persistence of the material acquired in the mind so that it may be reproduced at a time when required. It is persistence of changed mental dispositions.

Recall, recognition and relearning are the three experimental tests of retention. The amount of material that is recalled or recognised is the measure of retention. In learning and saving method, saving is the measure of retention.

Forgetting and retention both go together. Forgetting is the "weakening of the bonds that are formed in learning". In the opinion of Freud forgetting is a "tendency to ward off from memory that which is unpleasant". This has been criticised by Dr. River who says that we remember most of the things that we dislike. Again, experimental studies, too, tend to prove the unsoundness of Freud's view. "Lapse of time" and "lack of interest" are two reasons of forgetfulness.

The problem, how we forget has been studied in the laboratory. Ebbinghaus made experiments in 1885 to study the phenomenon of forgetting and retention. He discovered:

1. That after learning the material (nonsense syllables) to the point of one correct reproduction, forgetting sets in immediately and is most rapid in the early stages. It was found to be 42% after twenty minutes, 56% after one hour, 64% after nine hours, 66% after 24 hours, 72% after two days, 75% after six days, 79% after thirty one days*.

2. That nothing is forgotten completely. There is always a permanent retention of an appreciable fraction which facilitates the relearning.

An inference may be drawn from this that revision of anything, that has to be memorized should be made soon after the learning, on the next day at the latest ; and also, that, the revision should take place at comparatively frequent intervals. The period between practice may be, then gradually lengthened until the material is thoroughly learnt. Overlearning is necessary for delayed recall.

Other experimental studies have obtained similar results. The curve of retention falls down rapidly at first, then gradually becomes flat, never reaching the zero point on the time axis.

Radosaljeich from an experiment discovered that after learning the material (nonsense syllables) to the point of two correct reproductions, only 47% was retained after eight hours, 69% after 24 hours and 61% after two days.

Forgetting in intelligent learning of meaningful material is not so rapid. Nonsense syllables are forgotten more quickly, because learning of them is simply repetitive and involves no associations such as cause and effect. Historical material, scientific process, meaning of words and other material are retained better because they are tied together by associations.

Sensory-motor skills are retained best, meaningful material next and meaningless material most poorly of all.

Rate of loss differs from individual to individual. Loss of

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*Corret, *H. E.* : *Great Experiments in Psychology*, p. 111.

high school children is rapid. Loss of college children is found to be greatest of all.

In the earlier stages, loss is the least of all the stages. It has two reasons :

1. Strengthening mental power retards the course of forgetting. Mental development is sharply upward in the early stages.

2. It is reviewed more frequently in the earlier stages than in the high school and colleges.

REMINISCENCE

From some of the experiments on memory one thing more has been discovered. It is the phenomenon of reminiscence. It means that sometimes the capacity for reproducing what has been learnt may increase. In other words the lapse of time improves the memory. Ballard called this as reminiscence and defined it as a process opposite to obliviscence or forgetting. This is obvious from the experiment of Radosalvjevich.

Two explanations of this phenomenon are available. The one is "the freedom from fatigue that results from a night's rest", a behavioristic standpoint. The other finds this explanation to be the inadequate and unsound and puts forward a "principle of consolidation", endo-psychic organization of the after-effects into engram-complexes.

Forgetting is a gradual process of decline, reminiscence is a gradual process of improvement in memory. Both go together. Dr. Ballard's conclusions are:

1. That, improvement takes place unconsciously and spontaneously.

2. That, amount of improvement depends on interest.

3. That, the degree of improvement varies with the age of the subject. It is greatest with the young children and negligible with adults.

4. That, obliviscence (forgetting) and reminiscence occur together.

5. That, the interval for maximal reminiscence is about two days.

PERSEVERATION

Perseveration is another phenomenon that is accompanied by all forms of learning, mental as well as muscular. It is that process in virtue of which after-effects of experiences persist within the organism, though actual experiences are past. This phenomenon enables the individual organism to repeat the experience it has received, spontaneously and without efforts.

Like obliviscence perseveration, too, falls down rapidly immediately after the learning-experience has taken place. Loss of immediate memory is the result of the loss of perseveration.

Perseveration is an important characteristic-phenomenon of the personality. Individuals differ from one another as regards its amount. Each one of us has a definite amout of perseveration and this, to some extent determines the quality of personality. Low perseveration means emotional stability High perseveration means greater sensitivity and emotionality. Those who have a high degree of perseveration have been found to have an interest in history and literature. The low perseverators are found to have interest in mechanical and scientific matters.

It is due to this phenomenon that sudden change over from one activity to another activity produces some difficulty.

RETRO-ACTIVE INHIBITION

Retro-active inhibition is another factor that carries a great influence upon retention. It is the inhibition of retention of one learning activity, which is caused by the activity that follows immediately after that. Every activity in order to get fixed should take sometime. So an attempt to store the mind with facts, one after another in quick succession is not judicious. If this is done retroactive inhibition will set in.

Two contradictory theories of retroactive inhibition have been offered :

1. The Anti-consolidated Theory of Muller and Pitzecker. It says that perseveration and consolidation of experiences need some time. So rest, after a thing has been learnt, is favourable; and another activity involving hard mental work is inhibitive. But if the activity that follows is similar in content (material used) or in the operation performed, the retroactive inhibition will be stronger.

2. The Transfer or Interference Theory of De Camp (1915) and Webb (1917). This theory tells that as a result of transfer of some elements and effects from one activity to another an interference is caused in recalling. Several elements of both the activities get confused together with the result that retroactive inhibition takes place.

Remarkable results have been discovered by Dallenbach and Jakins when learning activity was allowed to be followed by sleep and waking respectively. It was found that :

1. Sleep, immediately after learning helps in consolidation of learning and memory traces.

2. It delays the forgetting which after sometime takes its usual course. Thus, there is little loss during sleep.

3. Forgetting goes very slowly and the material is well retained for a longer time.

In these experiments the subject was tested after one, two six and eight hours' sleep.

RECALL

Recall is the actual revival of what has been previously learnt. It is the reproduction of past experiences. We recall facts of information and knowledge list of names and other items. We recall learnt acts, sensory images, reveries etc.. Recall is fundamental to all thinking, reading, adding and problem-solving.

Recall has the following types :

1. Spontaneous and Deliberate Recall

Spontaneous recall is effortless reproduction of the material. In this one idea leads to another and a stream of past experiences rolls onward without any effort on the part of the person. Reverie is one type of spontaneous recall.

Problem-solving is an example of deliberate recall. In this the individual makes deliberate efforts to revive relevent past experiences, facts of knowledge and information. Examinations require deliberate recall.

2. Direct and Indirect Recall

When an experience, event or fact is reproduced directly and not through any other media or intermediary, it is called direct recall. Recall of a particular formula in the examination is direct recall.

When an object, experience, event or fact A is recalled and with it another one B comes up, here recall of B is indirect recall. Thus in indirect recall things and experiences are recalled not directly, but through various other stimuli. The processes involved in indirect recall are various laws of associations, e.g., similarity of sound, meaning shape and size, contiguity, vividness, sourrounding and circumstances etc..

RECOGNITION

Recognition is also reproduction of the past experience. But it is different from recall. Recognition is incomplete recall. In this we are not able to reproduce the experience, but we can recognize it, if presented again. In recognition, the individual is assisted by a sense-perception of the familiar experience. It is not so in case of recall. It is a kind of indirect recall, recall through a "feeling or sensation of familiarity".

A number of experiments have been performed on recognition. In one, twenty nonsense syllables were taken, out of which ten were read to a subject three or four times. After a lapse of time, he was asked to write down as many as he could recall. Then, these ten were mixed with another remaining ten and all were put before the subject to recognize those which he had heard before. This showed a remarkable difference between recall and recognition. Results of two experiments quoted by Vallentine, one with a class of 64 boys and another with a class of 75 boys reveal that in the former case one scored more in recall than in recognition, five scored the same in both and forty-four scored more in recognition than in recall.

Recognition is of two types—implicit and explicit or definite and indefinite. The implicit is primitive and is found in lower animals e.g. in animals recognition of their masters through their calls, pats, whistles and other actions. The explicit recognition is found in higher animals. In it knowing, thinking, judging, comparing activities of the mind are involved.

When the subject is able to recognize the object with all its details in a definite situation, its time, date and other components, it is definite recognition. When he recognizes the object, but not its time, date etc., it remains indefinite recognition. Thus, incomplete recognition is indefinite recognition.

INDIVIDUAL INDIFFRENCES IN MEMORY

As regards memory, wide differences are found amongst individuals. Some have good habit memory, others good pure memory, while still others both. Some can learn easily in a shorter time, but can not retain longer. Others learn with a greater difficulty but remember for long whatever they have learnt. These differences are due to the factors of (a) Interest, (b) Age, and (c) Material.

Those who have special interest in something can learn it quickly and remember it for long. It is not so with those who have no interest in that.

As regards age, power to acquire is greater upto the age 25, power to retain is greater upto the age of 12. Retention in old age is lost entirely, though events of childhood and youth are still clearly present in the mind. Things learnt in the childhood are retained better and longer. Children learn more quickly than adults. So there are memory-differences amongst the individuals accordingly.

As regards the material, some have a good memory for names, dates, figures, etc., others can learn language better, still others remember faces, and places quite well.

EXPERIMENTAL STUDIES

Experiments have been performed to study immediate memory and permanent memory.

IMMEDIATE MEMORY

Any of the immediate memories, auditory or visual may be tested experimentally.

In the auditory memory, the subject hears a number of digits or nonsense syllables when read aloud before him by the experimenter and is then asked to reproduce them in the same order. The experimenter reads the digits or the syllables distinctly and at a regular interval, say at the rate of one per second. First, he reads three digits or a nonsense syllable of three letters, then four and then five. In this way he proceeds on till the subject fails to reproduce a particular digit or nonsense syllable in three successive trials. The number of digits or number of letters of the nonsense syllable reproduced by the subject previous to that which he fails to reproduce is the memory-span of the subject.

It has been found that auditory memory-span of the school boy of 4 is usually four and that of the college boys of 14 ? is seven. Memory-span is greater at an advanced age. So material should not have bigger units in the early stages.

In the same way span of visual memory may be found using letters as well as meaningful diagrams.

Two important inferences have been drawn from these studies :

1. That, there is little correlation between auditory and visual immediate memory. Some have greater auditory memory-span, others may have greater visual immediate memory-span. It means that some can learn and understand through visual impressions more easily, while others learn better through

auditory impressions. In the class the teacher should make use of both.

2. Meumann finds that immediate memory develops slowly upto the age of thirteen; then it advances rapidly from thirteen to sixteen and then again more rapidly upto the age of twenty-five, when it reaches its maximum. As regards its application in education, therefore, the teacher should organize the lesson or the learning material into suitable units that can fit the memory-span of the boys. Boys of 4 or 5 have a memory span of four. So the words that consist of more than four letters should not be given them to spell and remember. Very long sentences should not be spoken in the class of younger children. Use of arithmetical figures of more than four or five digits is quite unsuitable in the earlier stages.

The Knowledge of memory-span may also be utilized in vocational selections. In selecting telephone operators, painters and sketch-makers, it becomes essential to know the auditory and visual span of the persons, as their efficency depends upon the use of these memories respectively.

PERMANENT MEMORY

There are three methods of studying permanent memory :

(a) The Learning and Saving Method.

(b) The Prompting Method.

(c) The Scoring Method.

In the learning and saving method, the number of repetitions consumed in learning a series of nonsense syllables is recorded. Then, after the lapse of some time, the same individual is asked to reproduce the series, which he is not able to do. Now, again, he is asked to learn it and the number of repetitions consumed this time is taken down. This time he requires fewer number of repetitions than he did in the first learning. The difference of both (number of repetition saved) is the measure of retention. If the number of repetitions in the first case was 30 and it is 20 in the second case, then the saving of (30-20) 10 is the measure of retention.

In the Prompting Method the series is presented in the same way as in the Learning and Saving Method. The subject is asked to reproduce after every presentation. Whenever the subject fails to reproduce, he is prompted by the experimenter by giving him the next syllable. The total number of promptings for first correct reproduction is noted.

In the Scoring Method, the series is presented a number of times, not enough to ensure complete learning. The subject reads aloud the pairs of syllables in trochaic rhythm. Thus, he learns the series in pairs. After an elapse of some time the subject is given the first member of any pair and is asked to tell the second. The number of correct reproduction constitutes the score which is the measure of retention.

LAWS OF MEMORY

There are certain conditions that facilitate revival of past experiences. These are called as the laws of memory. They are :

1. The law of preservation.
2. The law of association.
3. The law of habit.

The law of preservation says that experiences persist for a short time in the mind, after they have occured. Things which happen before us keep running in our minds. This fact facilitates the revival of past experiences. So it is an important condition of memory.

The law of association says that experiences tend to be reproduced by virtue of their association. This refers to the association of ideas of the British School of Associationism. The association of ideas according to them meant that ideas are preserved in the mind not in an isolated way. They are tied to one another with the result that if one is recalled, the other also appears along with it. In this way one idea calls up another. Daily life operates so easily and smoothly only on account of this association. When we go for a bath, we atonce recall the soap, the toil, the powder etc.. Had it not been so, it would not have been possible to pre-arrange for all these necessary articles at one time and much inconvenience would have been caused to us. In the same way when we speak of table, we atonce recall to our mind the chair, the stool, the bench and so on. Human experience is contiguous and a long trail of facts and events so bound together that if one of them is recalled to mind, the other automatically comes up. If ever you happen to go to Kashmir, your mind is filled up with a series of experiences. Now, if after a month or two you recall to your mind the word 'Kashmir', the whole series of those experiences will automatically emerge almost in the same order. This phenomenon is explained on the basis of the theory of association of ideas. It is still in use, but has widely departed from the old conception. Now, it refers to association of overt responses and not to "association of ideas". Thorndike's law of "associative shifting" and the "conditioned response" of the behaviourists are simply old conceptions in their new settings. According to Gestalt Psychology "all mental phenomena have a structure of pattern". All ideas, events, etc., therefore, are parts of some definite pattern, by virtue of which alone they are revived. One provides an stimulus to another to be recalled. The 'Law of Contiguity' is recognized by the behaviourists as well as by the Gestaltists. But according to the old "association of ideas" these are the following laws:

1. Similarity. 2. Contrast. 3. Contiguity.	PRIMARY LAWS
1. Recency. 2. Frequency. 3. Vividness.	SECONDARY LAWS

The principle of similarity says that similar things form a bond and are preserved in the mind together such as if one of them is recalled, the other also appears, e.g., the word tea may remind one of fruit-juice because both are similar in the sense that they are taken as refreshments.

In the same way, things that are contrasting appear in the consciousness together. It we speak 'white', 'black' may come to the mind by virtue of this principle.

Experiences that are contiguous are recalled together. If you have been financially helped by your friend in some difficult situation and even in life you recall that act of kindness you are bound to recall the friend who gave you the money.

In the same way things that occur recently, repeatedly (whose frequency of occurence is greater) and in vividly, are recalled together.

The law of habit says that experiences which are neither vivid nor interesting and meaningful are remembered and memorized by mere practice and mechanical repetitions. They are recalled not through associative force, but through the force of mechanical habit. This law refers to the rote memory.

QUESTIONS

1. Give the psychological nature of Memory and discuss its, various kinds.
2. Discuss True Memory and Habit. Memory with speical reference to their respective role played in Education.
3. Discuss the phenomenon of Retention and of Forgetting with special reference to the findings of Ebbinghaus and mention what application of the same can be made in Education.
4. Write notes on:
   Reminiscence, Preservation, Retroactive Inhibition, Recall, Recognition.
5. What are various methods employed in experimentation on permanent memory?
6. Give an account how experiments on immediate memory are conducted.
7. State and discuss various laws of memory.

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CHAPTER XV

GUIDANCE IN LEARNING AND MEMORY

What is more important for a teacher is not mere knowledge of the psychology of learning. For him it is its application to the class-room-teaching which is of importance. Since the greater part of school-learning is through the medium of language and symbols, guidance in learning shall be dealt with special reference to learning of verbal material and school subjects. For the purpose of guidance and improvement in learning the teacher first of all should know the factors that influence learning.

Efficient learning is influenced by the physical, psychological and some external conditions of learning. The teacher should take them into consideration and organize in such a way as maximum economy and efficiency may take place in education.

THE PSYCHOLOGICAL FACTOR (MOTIVATION)

Learning is an 'active process'. It is not a passive absorption of knowledge, not the mere reading of books or listening to lectures with the object of reproducing what has been read or heard. It is defined as 'modification and coordination of the responses of the organism', a physiological and objective bias of modern psychology. In other words we can say that in learning 'there is an organism in inter-action with its environment'. The organism is stimulated and it, then, responds to the environment.

In a word again 'learning is an activity'. If it is an activity, it must have some driving force behind it. If there were no such force either there should be no activity or forced activity. This driving force of learning activity is the motivation, a psychological factor in learning.

Motivation

Motivation has various aspects. They have been described as interest, incentive, drive, purpose and so on. "Motivation is the very heart of the learning process." It sets in motion the activity which results in learning. It also 'sustains and directs it'. It is the original source of all learning. That is why Dewey so emphatically said that education must be 'purposive.'

There are 'intrinsic' and 'extrinsic', two kinds of motivation. The learning carries its own reward. This reward is the interest. 'Interest lies within the activity' which "binds the pupil to his work'. In order, therefore, to arouse this aspect of the motivation, the teacher should make the subject-matter meaningful and significant. He should 'begin with the range of interest and capacity of the pupil'.

It is at the stage of introduction of the lesson that he may try to stimulate the pupils and stir up the intrinsic motivation force of learning. Once it is set in motion, it will take the pupils to the proper type of learning, 'self-learning', "wholehearted purposeful activity" which is a great characteristic of New Education.

The learning activity may not be taken for its own sake, for the sake of interest and enjoyment. It may then be motivated by extrinsic forces which lie outside the activity. These forces may be praise and blame, rivalry, competition, prestige, rewards and punishments, consciousness of progress, social approval, urge of dominance and so on. All these should be properly used by the teacher in the class-room-teaching in order to stimulate some motivation on the part of the pupils, otherwise learning will remain just an imposed activity. The pupils will not have willingness to learn. They will not be ready to learn. Where there is no WILLINGNESS, no STATE OF READINESS on the part of the boys, how can they be made to learn. In the New Education they strongly advocate the need of substituting social values as strong motivation-forces in the school life.

THE PHYSIOLOGICAL FACTORS

It has been said before, that learning is the "modification and co-ordination of the responses of the organism". But response of the organism depends upon the general tone of the organism. Learning also, therefore, will depend upon the health and other physiological conditions of the organism. Organic defects such as visual defects, auditory defects, focal infections, etc., fatigue, time of learning, atmospheric conditions, age factor, use of drugs, alcohol, tobacco, caffeine, sex differences, all influence the quality and quantity of learning to a great extent. The teacher should take them into consideration and adjust the school-work accordingly.

THE EXTERNAL CONDITIONS

External conditions are the environmental factors that influence learning. They refer to the planning of learning, management or arrangement of the total environment and creating situations which are most favourable to the learning process as a whole. They are :

1. Guidance

Proper guidance eliminates the chances and number of unnecessary errors and thus saves time. Acquisition, therefore, becomes quicker, but much guidance kills the initiative and originality of the pupils.

2. Active Recall

Active recall is necessary in all the processes of teaching. It tells the pupils as well as the teacher where learning is weak. It "affords a basis for checking its accuracy". "Learning is tested by recall". (Gates)

The teacher, while teaching, should frequently make use of this. The lesson may be divided into two or three compact and logical units; and, after each unit has been taught, he should put questions, ask the students to reproduce, to fill up the map, to fill up the blanks and complete the story and so on. The stage of testing questions after each unit in the lesson and the recapitulation stage in the last of the lesson-plan are good devices for active recall. Recapitulation stage should be very thorough and thought-provoking; and it should cover the whole of the lesson.

3. PRACTICE AND APPLICATION

Practice is essential for effective learning. Things become clearer and more intelligible when actually applied. Mathematical tables and formulae are better learnt and retained when freely applied in various situations. Application, thus, sets and fixes the facts firmly in the mind.

4. METHODS OF LEARNING

Each method has its own advantages. The teacher should take into consideration the factors (material, age, maturity, and conditions of the learner upon which the success of a particular method depends) and adjust his teaching accordingly. A combination of methods is generally considered superior to either method used singly.

5. DISTRIBUTION OF PRACTICE PERIODS

The experimental evidence is not in favour of continuous study over a long priod. Distributed efforts give relatively greater return. If sixty minutes are to be devoted to a particular study, it will be more fruitful to give 5 minutes twice a day for six days than to sit continuously for one hour and study in one single long sitting.

6. LENGTH OF PRACTICE PERIODS

The length of the practice-period depends upon the type of material or the subject, interest of the learner and the surroundings. In case of memorization and arithmetical operations, the maximum period of productive study has been found to be 20 to 30 minutes. Period of more than 30 minutes is unproductive. It may be different in case of history or geography. Interest in a particular material may extend the limit.

7. KIND OF MATERIAL

The amount retained depends upon the material that the learner has to learn. Meaningful material is retained over longer periods with less loss than nonsense syllables, numbers and isolated words. Pictures and other concrete objects are retained for longer period than their word-equivalents. The teacher, therefore, should make the lessons as meaningful as possible. It depends upon the approach of the teacher, selection of the material and its arrangement, choice of words and expressions used.

8. THOROUGHNESS OF LEARNING

Retention depends upon the 'thoroughness of initial learning'. Experimental studies assert that 50 percent of over learning is highly advantageous for retention. It counteracts forgetting.

9. AMOUNT AND CHARACTER OF ACTIVITY FOLLOWING INITIAL LEARNING

Sometimes loss in retention is caused by the interference and inhibition of the old learning by the new. The character of the activity that follows initial learning, sometimes, inhibits its return.

10. RECITATION METHOD

The teacher can achieve good results by the use of the Recitation Method. It is of great value as it tells the learner wherein lies the weakness of learning. Experimental studies disclose that three-fifth of the period of study should be devoted to recitation. It eliminates the errors that are formed due to first wrong impressions.

11. MNEMONIC DEVICES

When it is found difficult to arrange the material into meaningful associations, the teacher can successfully make use of mnemonic devices, a kind of "mechanical memory", e.g., "I before E, except after C......" and "REAUFP" to remember the fundamental principles of Dewey's conception of education. In REAUFP each letter refers to one principle that begins with the letter e.g., R means Reality, E means Experience, A means Activity, U means Utility, F means Flexibility and P means Purpose. These are devices "invented by the student himself to fit the situation". They are the most effective, "little tricks for organizing unrelated words and facts".

In this way if the teacher keeps these factors constantly in view and makes their judicious and intelligent use in the class-room-teaching, he may succeed in making learning efficient and effective. He can also achieve economy in learning in this way.

These are the three categories of the factors that influence acquisition and retention—learning in other words. Recall can not be improved.

If the problem is how to improve memory, the same principles apply. Memory, too has three phases, learning, retention and recall. So all the principles that influence learning, equally influence memory.

QUESTIONS

1. How will you guide learning in case of your pupils? Give all the factors that you will take into consideration.
2. Explain "motivation in learning" and mention what efforts a teacher can make in order to motivate his pupils to learn.
3. What are various factors related to external conditions that affect learning? How can you improve them?
4. What is the psychological factor in learning? How will you apply this in the class-room?

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CHAPTER XVI

THEORY OF FORMAL DISCIPLINE AND TRANSFER OF TRAINING

Learning is the most fundamental problem of education. But nothing is learnt for its own sake. Learning is a dynamic process and so what is learnt in one situation must be capable of being applied in future life and further situations. It means what is learnt in one situation must have some transfer value. It was on this ground that various subjects were advocated to be included into curriculum. A professor of mathematics would always say "mathematics and language are the meat and potatoes of the educational diet". The problem effects directly, both the content and methods of teaching.

This aim was shaped into a theory known as the theory of "Formal Discipline" by the earlier educators.

FORMAL DISCIPLINE

Formal Discipline should not be confused with Transfer of Training. The modern psychologists do not accept the original theory of Formal Discipline. They believe in the transfer of training. Yet, the influence of Formal Discipline has not died even uptil now.

Formal Discipline seems to have been an outgrowth of the belief in the faculty theory of the mind. Two faculty theories of the mind are distinguished—-'general-faculty-theory' and 'organismic-unity-theory'.

In the 'general-faculty-theory' mind was considered to be composed of various powers or faculties, each working independently. Formal Discipline according to this theory meant that one study sharpens this or that faculty and the result transfers to another study.

'Organismic-unity-faculty theory' is found to be stated in Greek Literature. To the Greeks mind was unitary whole which expressed itself in the activities of judging, reasoning, remembering etc. These powers or faculties were not considered as isolated from one another; but were viewed only as distinct modes of activity of the same mind.

Modern psychology with its stress on neuro-physiology to explain mental processes has discarded these faculties of the mind.

Thus Formal Discipline simply means that the powers or the faculties of the mind, such as reasoning, imagination, thinking, etc., may be trained or influenced by the study of special subject matter. The word 'formal' in Formal Discipline signifies that it is the form, not the content of the activity which is important in teaching. If the 'form' of activity involves reasoning it will sharpen the reasoning faculty, whatever be the subject matter, a sum of arithmetic, a problem of science or logic. This will transfer to the 'form' of other activities, if the form involves the same powers and faculties. In the middle of the 19th century Huxley and Spencer advocated the inclusion of natural sciences in the curriculum on the same ground.

UNSOUNDNESS OF FORMAL DISCIPLINE

Due to accumulation of a great body of useful and necessary subjects, rejection of faculty theory by modern psychology and a number of experimental studies on Transfer of Training, the theory of formal discipline was discarded.

The first experiment of William James in 1890 and experiments of Thorndike and Woodworth in 1903 proved the unsoundness of the theory of Formal Discipline. All these experiments discovered that :

1. The improvement does not transfer uniformly and equally to the learning of other material.

2. The transfer may be of indifferent value or detrimental as well as helpful.

These discoveries convinced that the fact of transfer can not be explained as due to a general all round improvement of mental faculties or the Formal Discipline.

TRASNFER OF TRAINING, THE MODERN ISSUE

Modern researches lead only to believe that there is the "possibility of general training in the sense of training for adaptability." This is only a little more than the new version of the old Formal Discipline-theory. This is referred to as Transfer of Training.

Through recent researches on Transfer of Training, it has been discovered that "carry-over from one situation to another" is definite. Thus, Transfer of Training is concerned with the question whether or not the learning of a material A aids, hinders or has no effect in the learning of another material B. Transfer of Training assumes nothing about the faculties. It is concerned with how the organism meets the situation, B, C, D, and so forth after having had an experience in the situation A. Educationally, it is concerned with finding out how the organism can benefit to the largest degree from its experience in one situation, when it finds itself face to face with other situations. Thus, transfer of training means transfer of experience in one situation of learning to another situation of learning. When that which is acquired in one situation appears in another we speak of Transfer of Training.

WHAT ACTUALLY TRANSFERS

Habits, dispositions, attitudes, ideals of attention, accuracy, neatness, fairmindedness, promptness and a host of other qualities may develop and transfer to other situations.

EXPERIMENTAL STUDIES

A number of experiments have been performed to study the problem of training. Between 1890 and 1940 about 211 experiments were performed. Out of these, in 53 experiments 25% transfer took place (considerable); in 95 experiments 45% transfer took place (appreciable); in 16 about 8%(varying with conditions of learning), in 20 about 9% (very little); in 9 only 4% (no transfer) and in 18 again 9%.

Thus, there can be little question about whether or not there is transfer. The problem of education is how to achieve the greatest amount of favourable gain in one situation as a consequence of experience in another.

It has been discovered through these studies that transfer takes place in three ways—positive, negative and no transfer.

Various types of experimental studies are available. Most important of them are :

1. Sensory-motor-material type, in which the material used had been of sensory-motor-type.
2. Perceptual-material-type in which learning took place on the perceptual level.
3. Memory-material-type, in which use of memory was made.
4. Reasoning-material-type, in which material used involved reasoning.
5. Ideals-type, in which material used tended to form certain ideals on the part of the learner.
6. Various school-subject-experiments.

Transfer problem studied with reference to school subjects is important from teaching point of view. Prof. Briggs took two groups of seventh grade pupils, equal in intelligence. One studied grammar and the other language and composition. The grammar-group improved in the ability to see likeness and differences. He proved the positive transfer. Many other studies have been made. H.O. Rugg found that a course in descriptive geometry transfers 32% to another geometrical material, but only 7% to non-geometrical material. Hewins, a teacher showed that 34% transfer takes place between two kinds of botanical material, but only 5-4% between botanical and non-botanical. Thorndike and Rugger showed that study of Latin improved knowledge of English language. The degree of positive transfer was found to have varied from a very slight amount to 93%.

THEORIES OF TRANSFER

To explain how and why transfer takes place, psychologists have advocated four theories. These theories also describe what transfers from one situation to another. They are :

1. Theory of Identical Elements of Thorndike.
2. Theory of Generalization of Experience of Judd.
3. Ideals-of-Procedures-Theory.
4. Configuration Theory.

1. Theory of Identical Elements holds that because in two situations certain elements are common and they require the functioning of the same mental abilities, therefore, transfer takes place. Some neural bonds are formed in learning one situation, and this causes transfer when in another situation the same bonds are required to be utilized. What is, therefore, called transfer by Thorndike, is simply repetition in a new situation of behaviour which was previously learnt. Some like to extend it to embrace identities of substance or content of procedure, mood or attitude.

2. According to the theory of generalized experience transfer takes place due to certain generalizations of experience in one situation; and it takes place to the extent to which one generalizes his experiences.

In this theory, method of teaching or study is the most important factor. The content or the subject matter is of little significance. The function of education is to discipline, to train intelligence, to develop a scientific attitude, small training in observation, discrimination and reasoning which may transfer to real situations of life. This sounds well and seems to be possible if viewed from the standpoint of this theory. Social studies clamour for a claim in the curriculum on this very ground.

The transfer-value of subjects to be taught becomes more important during the secondary-school-period. The individual is to become an active and useful citizen of the complex social order; so he must become completely familiar with the social sciences. Mere information is not enough for him. Certain ideals, habits, attitudes and mental dispositions are also important. These are procedure-values and may be learnt by way of generalized experiences through various social sciences.

3. Ideals of Procedure is another theory. It is generali-

zation plus appreciation. It is a special form of the generalization theory and has been formulated by W.C. Bagely. He holds that generalization itself will not tell the whole story. To be effective the generalization must be made emotionally toned so as to take the form of and rise to the level of an ideal.

4. Configuration Theory is a hypothesis of the Gestalt psychology. It is a negation of the Theory of Identical Elements. According to this it is the "insight" gained in one situation that transfers. So unless a task is carried out with insight or understanding of the whole situation the effects of training cannot be transferred. It emphasizes that the more meaningful an experience, the richer its conceptualization and deeper its understanding are, the greater will be the transfer-possibilities.

IMPORTANCE IN EDUCATION

Education is essentially a social process. It begins with the psychological nature of the child, but ends with the needs of the society. The new education is progressive and aims at preparing the individual for the community life. It aims at enabling the individual to take his place as a worthy citizen in his complex social order, particularly in a democratic community. For this aim in view, the new education seeks to develop desirable social attitudes, moral sentiments and good habits in the children. In order to achieve this the content of education, method of teaching, school environment and the whole of situation in which the child is educated should be such as the greatest amount of transfer of desirable attitudes, habits, emotional patterns and ideals may take place. Education should be so planned as the way of life cultivated in the school may continue in the community life outside the school. Thus, transfer-problem becomes fundamental to all education. The teachers can bank upon the following suggestions :

Transfer depends upon the content of education (the curriculum), methods of teaching, subjective conditions of the pupils, mental ability of the pupils and the environment in which learning takes place.

Transfer value of the subjects of the curriculum is very great. This is essential for the intellectual development of the pupils. Transfer occurs from Sanskrit to Hindi and Persian to Urdu. In each of the field, the languages, the social sciences and the natural sciences, there are inter-relationships that should be emphasized by the teachers. Facts in various fields should be brought togeter. The thrilling relationships of knowledge make it educationally unwise to try to approach a problem in too compartmentalized a way. Related facts should be brought into connections regardless of the fields from whch they are taken. Much better education will be produced by bringing to bear on a subject the pertinent facts from many fields. Teaching should be planned for this purpose. History should not be taught as a mere narration of dates, facts, wars, battles and events. It should be taught as a story of the past describing and explaining the forces and factors that cause people to behave as they do. True history of this type will help us understand people, interpret their behaviour and predict what they will do under certain circumstances. Thus, history should be made the root of the present.

The problem of new education centres largely around the actual social life. "Education is life and not a preparation for life." So for maximum transfer in this line, the teacher should not rely much upon the subjects of the curriculum and formal teaching. He should choose those occupational activities which are most typical of life, which offer the greatest opportunities for enrichment of experience and the practice of the social virtues. The habits, thus formed, may transfer to life to be actually lived in the larger community. In this way education may contribute to the reconstruction of the social pattern.

Two movements have got spurred in education. The one is that education should have some utility for the child. Transfer of training may be made a good basis for social-utility-movement. Many valuable social dispositions transfer to the actual situations of life, if the subject-matter and activities of the class-room are similar to those encountered in the community life. Methods of attack, knowledge and insight, technique of learning and problem-solving, interest, poise, habits and ideals of caution, honesty, accuracy, thoroughness and initiative are a few things that may transfer. All these are of great social utility. But success in this depends upon the conditions of the environment, the methods of teaching and approach by the teacher.

Second movement in education is a logical outgrowth of the Theory of Identical Elements. It assumes, that, methods of teaching must be most suited to real life. It must be problem-solving, as people are largely engaged in solving practical problems. Initiative is required everywhere in every walk of life. So methods of teaching must foster it in the boys. In otherwords, problems and activities of the school ought to be life-like. The most life-like the problems are, the greater the transfer will be to the out-of-school-life It signifies that education should be more closely related to significant personal and social activities; and that it should be less academic artificial and isolated. The school must teach the pupil how to participate fully and effectively in all phases of modern life. The same is the ideal that lies behind the “community-school” and “Project Method” of Dewey. It emphasizes that education should be real. Only then, maximum and useful transfer can take place.

A life-situation in the school and real problems of life alone are not enough. Subjective conditions of the pupils are also important factors in the determination of what and how much will transfer. W.C. Bagley opines that generalizations must be raised to the level of ideals to ensure transfer. A sort of emotional generation round about the ideals, attitudes and dispositions is essential to make them an integrated part of community life.

Transfer may fail if the pupils are not able to find out the common identical elements. So the teacher should pay attention to it. He should train pupils to “dig into” situations as a whole and find out their more subtle features. He should himself point out the critical or essential facts of relationships which a pupil otherwise will miss. This he may achieve through thought-provoking questions and arousing curiosity at right time. Insight as a whole will transfer in this way.

The amount of transfer also depends upon the mental ability of the pupils. The teacher should keep this fact in mind. Bright children profit more from a situation than average children, and average children profit more than dull children. Thus, transfer-value of subjects and situations vary accroding to the mental ability of the pupils. The teacher should adjust his planning, therefore, accordingly.

Firstly, he must decide what he wants to transfer to the child.

Secondly, he must learn by experience and experiment as how he should adjust or organize his teaching to allow maximum transfer.

Thirdly, he must take into consideration the subjective conditions and abilities of the pupils.

Fourthly, he must devise appropriate methods of teaching, organise proper school environment and adopt himself a favourable attitude and desirable disposition.

Thus, the teacher can best fulfil his responsibility towards society.

QUESTIONS

1. What do you understand by "Formal Discipline"? In what way it is unsound and different from Transfer of Training?
2. What do you understand by Transfer of Training? Give an account of various types of experiments that have been performed in this field. What conclusion have been drawn out of these researches?
3. How will you explain the phenomenon of transfer of Training? Give an account of various theories that have been expounded to explain this.
4. What is the bearing of the psychplogy of Transfer of Training on Education? Discuss and suggest ways of making transfer of training educationally beneficial.

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CHAPTER XVIII

IMAGINATION

In the Chapter IX, "Knowing Our World" we have seen that "knowing-activity" cognition involves a process of mind that consists of various functions such as attending, sensing, perceiving, thinking and reasoning. Attending, sensing and perceiving are the first activities in the order. Sense-impressions organizing into percepts are the first raw-materials of thinking. Thinking and reasoning are the highest forms of cognition. Perception is the lowest form of thinking. It has been discussed in details in the previous chapter. Only Imagination, Reasoning and Problem-Solving will be treated in the following pages.

IMAGINATION

Because of the ambiguity of the word, it is difficult to understand the nature of imagination. The ambiguity is attached, mainly, to the verb "imagine" used in two different senses, corresponding to the nouns imagination and image, which in psychology have two distinct meanings.

IMAGE

We have a mental image when we have any mental experience through any sense-organ without there being any external object to initiate the sensation, e.g., while sitting in the class we can have images of taste and smell of food, auditory images of appealing songs moving to and fro in our minds and also images of friends, companions, events and incidents. When we have images in the mind, we feel as if the things represented by these images were actually present. The image of lemon produces mouth-water. Gaytune-image makes cheerful. The image of the dead friend makes sorrowful just in the same way as we felt when we first saw him lying.

Thus, image is "more or less faithful representation of the past". It is thinking of the past events without their being present. Drever defines image as "apprehension of an object or objects themselves which originally determined our sense perception."

SENSATION AND IMAGE

Some books on psychology have likened image to sensation and have tried to show that images are inferior to sensations. In reality, there is vital difference between sensation and the image. The image is the mental copy of an object. Sensation is the mental experience aroused by the object or its mental copy. If the object is present before our eyes, it reacts upon the organism and produces a specific sensation. If in the absence of the concrete object we recall only its image, the image also produces more or less the same kind of sensation. Hence sensation is an accompanying phenomenon of the image.

Yet, there is the difference between the sensation caused by the actual object and that caused by its image. Firstly, the sensation caused by an image is not vivid like that one caused by the actual object. The sensation of the actual object has a broader background, while the sensation of the image carries only most intense features of experience with it. Secondly, the sensation of an actual object is more intense, more striking and stirring. The bursting up of a shell is much more startling than its image. Thirdly, percepts (sensation of actual object perceived) are more distinct, while images give fainter and sketchy sensation. Fourthly, image sensation is shortlived and difficult to be kept before mind's eyes for a long time. While the sensation of actual object lasts till the object is there. Fifthly, image-sensation is inferior to the sensation caused by the actual object in the sense that the latter is the source of new information too.

IMAGERY

Imagery refers to the types of images individual has. Many persons lack imagery. Imagery includes various types of images, for example, visual, auditory, olfactory, gustatory and motor or kinaesthetic. According to the strength and predominance of one or the other individuals are respectively classified as Visile, Audile, Motile, Tactile, Olfactile. Generally, visual imagery is the most predominant.

As compared to actual perception, imagery lacks details, stability, clarity and intensity.

INDIVIDUAL DIFFERENCES IN IMAGES

Individual differences are found with regard to the imagery. These differences are of the following types:

I. differences within the same individual from one kind of imagery to another. One person may have dominant visual imagery, but may lacking good auditory images with the result that he may well remember the movements of a dance while failing to recall the speech or the dialogues.

II. differences from individual to individual. All persons do not have the same type of imagery. Some may be visible, other audile and still others motile.

III. There may be differences according to the stages of development. Children do not have the same type of images as the adults have. Children's images are largely concrete, while adults use more of verbal images. That is why it is very necessary to make the lesson for small school-children as concrete as possible. That is why Rosseau emphasized learning through nature for small children.

EXPERIMENTAL METHODS OF INVESTIGATING IMAGERY

Imagery is studied by the following methods:

1. GALTON'S QUESTIONAIRE METHOD

In this the subject is asked through questions to reproduce different kinds of images. This method was adopted, first in 1880 by Galton.

2. FREE ASSOCIATION METHOD

Giving a word to the subject and asking him to go on speaking whatever comes to his mind.

3. *Learning Method*

In this, something is learnt first, and then after the lapse of some time it is asked to be reproduced. The material reproduced will represent the strength and type of the imagery one has.

4. *Method of Distraction*

In this, while learning, the subject is provided with visual, auditory and motor distractions. The type of imagery is determined by the most effective distraction.

5. *Objective Tests*

The best known objective measure of imagery is the "Assuage Test" devised by Wilhelm Stern. In this a picture is shown and the subject recalls as many details as possible. "Ink-Blot-Tests" are very famous in this field. They have been designed by Binet and have further improved by Whipple.

IMAGINATION

Imagination is not thinking of the past or mental reproduction of the past events. It means something more than image. It implies that something new is evolved. Yet, there is no sharp dividing line. Images are an essential part of imagination. Drever uses ideal "representation" for both image as well as imagination. Imaging is "reproductive imagination" while real imagination is "productive imagination".

The dictionary says that imagination is a "creative faculty of the mind". This is not enough to trace the nature of imagination. Imagination is inventive. Most psychologists use it to designate CREATIVE THINKING OF INVENTION. In this sense imagination means "forming new combinations or patterns out of past experiences, resulting in an original product".

Mc Dougall recognizes three levels of imagination—reproductive, constructive and creative. The first is just the memory and what we call image. The second is just a "pre-perception" which implies a future reference and in which we have before our mind, some of the unexperienced images. A story writer, for example, before starting to write has to bring about before his mind certain future images of what he has to write about. This is perception of future images. This is constructive imagination. In the creative imagination there is "creative combination of the elements of previous presentation".

The real imagination is constructive and creative. Constructive imagination and creative imagination both are the aspects of the same process. There is a difference of degree only.

However, we cannot exactly define imagination. We can simply give a description of it.

> "The poet's eye, in a fine frenzy rolling,
> Doth glance from heaven to earth, from earth to heaven,
> And an imagination bodies forth
> The forms of things unknown, the poet's pen
> Turns them to shape, and gives to airy nothings
> A local habitation and a name."

This description involves certain qualities and characteristics of imagination as,

(1) Creation of something new,
(2) Part played by the images,
(3) Final result taking a concrete form,
(4) And being a thing of novelty in its finished form.

KINDS OF IMAGINATION

There are various ways of classification of imagination. But Drever's classification seems to be the most appropriate. First, he classifies it into two separate heads—receptive and creative.

RECEPTIVE IMAGINATION

In the receptive imagination, the subject simply receives the clues, ideas, thoughts, images and concepts. The reader of a story, for example, simply combines the elements in the same way as the writer has done. The reader does not create, he simply carries an imagination of the story created by some one else.

CREATIVE IMAGINATION

In the creative imagination the subject creates something new, for example, the writer of the story, who out of his imagination produces a story which is original and new.

Creative imagination is of two types—"pragmatic" and "aesthetic".

(i) *Pragmatic Imagination*

It is imagination restricted by certain conditions. It is controlled imagination. Object drawing is an example of pragmatic imagination. Making a table or a chair calls forth pragmatic imagination on the part of the carpenter.

(ii) *Aesthetic Imagination*

In aesthetic imagination, the mind is essentially free. But it does not mean that there is no systematic thinking. The thinking is systematic and also controlled. But the control is not objective or imposed from outside. It is subjective, coming from the withinself of the thinker himself.

Another distinction between pragmatic and aesthetic imagination is that of the pleasure or enjoyment gained out of the thinking activity. In the aesthetic imagination the stream of joy runs all through the activity, while in the pragmatic imagination, joy or pleasure comes after the activity is over. The carpenter who makes a table gets pleasure only after he has completed it and sees it in its finished form.

Pragmatic imagination is of two kinds—practical and theoritical. It becomes practical if something concrete is created. It remains theoritical if it results simply into certain enunciations of hypothesis.

In the same way aesthetic imagination, too has two different kinds "artistic" and "fantastic". It is "fantastic" when the mind has no purpose, no plan, no direction, no definite aim and nothing of the sort. It is "artistic" when there is some purpose, aim or direction. Day-dreaming is an example of "fantastic imagination", writing a story or composing a poem is an example of "artistic" imagination. "Fantastic" imagination is the free play of thought or thought not directed toward any particular goal. This may also be put under the heading "artistic" thinking. "When one's mind is at rest and his thoughts playing freely among themselves, ideas, memories, associations, fantasies, images, plans, hopes and dreams roll by and carom off each other in luxuriant but often unrewarding display, it is called "reverie," an aspect of "fantastic" imagination, set in motion by stray impulses from any where."

IMPORTANCE IN EDUCATION

Imagination is a gift of the highest importance. It has a great social and individual value.

1. Imagination arouses sympathy even in the absence of the sufferer. This is of great value in social life. Successful acting of the cinema-actors depends on the imagination of emotions to be carried. Tactless or stupid man can not have this kind of sympathetic imagination. An insight into other people's feelings to an uncanny extent is possible only through imagination. It is due to the power of imagination that teaching through dramas in schools becomes very effective.

2. Imagination essentially precedes all inventions. Invention of gramophones, wireless telephony, theory of Karl Marx must have followed some kind of imagination before they were actually discovered.

3. Imagination is the source of pleasure. Child's make-believe plays, boys' day-dreaming etc. are only imagination pure and simple. In all such imagination boys get pleasure and added satisfaction in life.

4. To happiness it adds depth and richness by uniting to our immediate experience the experiences of other minds and by revealing aspects of things which we had not previously noticed and which when noticed are found to be extremely beautiful.

5. In discontent or boredom it affords an escape into a world in which we are strong, clever or successful.

6. Through imagination we gain variety and possibility of new experiences at all times.

7. For all technical and material development 'theoritical' and 'pragmatic' imagination are very important. For new creations 'artistic' imagination is the most fundamental.

8. 'Aesthetic' imagination is inevitable in the development of higher ideals, religious sentiments and in the realisation of 'truth', 'beauty' and 'goodness'.

9. 'Fantastic' imagination is essential for the playful activities of the children. Play involves imagination.

TRAINING IN IMAGINATION

If imagination has so much social value, it must be encouraged and trained during the period of education. Following are the few points that should be kept in mind:

1. Efforts should be made to cultivate a tamer kind of imagination and check the exuberance of it, so that it may be useful in composition-lessons and other lessons.

2. Children should be taught to distinguish between fact and imagination. But not one manifestation of imagination should be crushed in cultivating another. We should try to cultivate an imagination which does not drift away from reality but works in and through reality.

3. Experience is the source of imagination. It refines and directs our natural imaginings. Imagination is much influenced by experience. Children having no experience can not imagine at all. Elements on which mental pictures are built in imagination, are provided with by experience. The teacher, therefore, should enrich the mind of the pupils with facts, information and experiences of concrete types as far as possible. Illustrations and vivid pictures are the best means of enriching the child's mind and cultivating imagination. The imagination of a poet, though soring high up in the sky, draws its strength from the past images.

According to Wordsworth four things are necessary for a poet—(1) Observation (2) Sensibility (3) Reflection and (4) Imagination and fancy.

DAY-DREAMING AND EDUCATION (DANGERS OF IMAGINATION)

Imagination as a means of escape or relaxation is condemned in education. Day-dreaming as such should be checked, therefore. Day-dreaming is a fulfilment of a wish denied in ordinary life.

Mandel Sherman of Chicago University divides day-dreams into the casual and the systematic. Casual day-dreams take place about our momentary aspirations or conflicts. Systematic day-dreams are due to permanent underlying motives and their frustration. This causes a kind of personality-mal-adjustment. Eugen Bleuler calls day-dreaming "autistic thinking" which is "self-centred, illogical and unrealistic" and which has a "conquering hero-type".

Day-dreaming is not in itself bad. It becomes dangerous only under certain circumstances or when carried to excess. It is condemned on the following grounds :

1. Waste of time which can be more profitably utilized.

2. Sometimes the wishes which the day-dream satisfies are not wholesome, e.g. sex and love-wishes.

3. It involves an escape from life.

4. Excessive indulgence in it may result in an impoverishment of experience and so lack of adaptive capacity.

5. It may weaken "active purpose", and cause the personality to become less wide and forceful.

6. It may arrest the normal growth of personality and may result in some kind of abnormality.

To remove these dangers the teacher should check excessive day-dreaming and should encourage children to employ their imagination in the service of reality. To achieve this, he should make them happy in and through reality. "Imagination which floats away from reality is often the child of unhappiness." So unhappiness should be ousted.

QUESTIONS

1. How will you define Imagination? What is its importance in Education?
2. How will you distinguish between Productive Imagination and Reproductive Imagination? What is the significance of each in Education?
3. Distinguish between image and imagination and give various methods of investigating imagery of the individuals.
4. Write a note on 'individual differences in imagery' and discuss the role of imagery in education.
5. Give various kinds of imagination and show with the help of concrete examples where each one of them is involved in education.
6. What steps will you take to train the imagination of your pupils? Illustrate with examples from teaching.
7. Aesthetic imagination is inevitable in the development of higher ideals and in the realisation of Truth-Beauty and Goodness. Discuss.

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CHAPTER XVIII

THINKING

REASONING AND PROBLEM-SOLVING

Human being is superior to all other beings. His superiority lies in his superior ability to think and reason. He is gifted with the faculty of thought and reason and is called a rational being. This quality of his being has resulted into a vast structure of culture, science and systems of knowledge. Adjustments of life are possible only in virtue of this ability. Man has ever thought how he should behave with his fellow beings, what he should do for furthering social peace and harmony. As a result of this, different social and political institutions have taken shape. Thinking of man has been an inevitable factor in the evolution of the society to a complicated structure.

THE NATURE OF THINKING

On the cognitive side thinking includes all forms of mental activities. It includes perception, imaging, memory concept-formation and imagination. All these are nothing but different forms of thinking Yet when we speak of thinking in psychology, it refers to only one and a specific form of mental activity which is different from all previous activities. It is different from Imagination, in the sense that imagination is "mental manipulation of past experiences resulting into something new. While thinking is "mental exploration" of new relations resulting into solutions of the problems. It is difficult to separate them as both go together almost in all situations.

Thinking has a motive behind and can not be studied apart from needs, drives, motives etc.. Every individual has to adjust to his environment. This necessitated by his needs and drives is followed by volumes of thinking on his part. When there is an accident, he has at once to think what ought to be done. When one's social prestige is at stake, he has to think and plan how to get out of that difficult situation. Thus, thinking enables the individual to solve the problems of his adjustments.

Thinking is conative in nature and takes place when some difficulty crops up that requires the individual to make new adjustments. He thinks, reasons out and arrives at a solution. Thus, in other words thinking is the same as problem-solving or reasoning.

The most orderly process of thinking is problem-solving or reasoning. It is the highest form of thinking.

PROBLEM-SOLVING

Problem-Solving is thinking in terms of some problem and its solution. In this, thinking is stimulated by some problem. The problem arises when the individual selects a goal and something obstructs him to reach the goal. In the words of Prof. Dewey it is a "felt difficulty".

Thinking in problem-solving has the following features :

1. It is directed by the goal and perception of the essential relationship in the situation.

2. It is selection because relevent experiences are recalled and selected.

3. It is insightful because selection and reorganization of experience are its keynotes. A means-ends-relation governs this selection and organization.

4. It is creative, resulting into something new.

It is critical, for in it happens the evaluation of the validity of hypothesis or tentative solutions.

Reasoning is the tool of thinking in problem-solving. Reasoning is stimulated when there is a problem to solve. It involves.

(a) Selection of past experiences or a systematic search for new information relevent to the goal.

(b) Perception of the relations,

(c) Devising means to the end and adopting them.

Thus, reasoning is "productive thinking". It is "creative" and "reflective" in nature, a process of "understanding" and "insight".

Reasoning is closely related to intelligence.

Individuals widely differ in their capacity to reason.

The ability to reason develops gradually. Therefore, at no age-level education should be purely acquisition of facts and learning by rote memory.

Reasoning may be inductive or deductive. It is inductive when generalizations are deduced from the observations of a number of individual particular cases. It is deductive when general inferences are drawn from particular cases.

John Dewey uses the word "reflective thinking" for reasoning process and gives the following five steps in the process :

1. *Awareness of the Problem.*

First the individual should feel the difficulty. Dewey says, "the origin of thinking is some perplexity, confusion or doubt. There must be something that occasions or evokes thinking".

2. *Defining the Problem.*

This is the second step. At this stage, there is selection of experiences and "keeping to the problem".

3. *Locating, Evaluating and Organizing Information.*

At this stage thorough exploration and organization of facts take place. There is an evaluation of information at this stage.

4. *Formulation of Hypothesis.*

At this stage some tentative hypothesis is formulated.

5. *Verification.*

"Complete act of thought" ends here.

Reasoning is very important in education. It should be learnt. Teaching should improve methods of reasoning, and critical thinking should be stressed in all fields of education.

REASONING AND CREATIVE THINKING

Creative thought and reasoning are similar, in that both are directed toward a goal. Creative thinking, imagination, productive imagination and productive thought all have about the same meaning.

But in one respect there is a difference between creative thought and reasoning. The differences are in outcome and procedures. In ceative thinking the outcome is original, both personally as well as socially. Secondly, from the point of view of procedure, "reasoning follows a rather straightforward course, through deep, perhaps, but well marked channels, where a creative thought travels its own way, progressing towards the goal, if it does, by irregular and unpredicatable advances." Creative activity differs from reasoning in the steps or the phases followed by it.

There are four phases of creative thought—preparation, incubation, illumination and verification or revision.

At the preparation stage there is an organization of the data, setting up in requirements of the problem and the production of relevent ideas and thoughts. This is, thus, focussing of consciousness upon the problem.

Incubation consists of "spontaneous recurrence from time to time of other topics". It is forgetting the problem temporarily, working on it occasionally before it develops into a usable product. It can be best defined as a "recurring idea".

Illumination is the emergence of the central idea, form or the design. It appears "suddenly in a flash of insight" and "mysteriously".

Verification or revision is the "refining and polishing of the central idea, i.e. "putting it into finished form".

But there is no sharp demarcation between these phases. They overlap each other.

TOOLS OF THINKING

The following are the tools of thinking :

1. Objects (perceived, recollected, imagined).
2. Concepts.

Concepts are the most important elements. They have been described as general ideas, symbols and names referring to the general class of a particular object.

Concepts result from perception. When similar objects are perceived in different contexts, they are segregated as a class and named by the subjects. Thus, the steps in the formation of concepts are :

1. Observation of particular objects,
2. Analysis of each of them,
3. Comparison of them with one another,
4. Generalization, and
5. Naming.

Concepts may be formed about objects, abstract qualities or relations.

People differ widely as regards their concepts of different objects, qualities and relations.

Concepts are of great importance and value as they :

1. Simplify the process of thinking by reducing the number of the objects of thought, organizing them into a hierarchical system—individual objects under one single name, these under higher names and these, again, under still higher ones.

Thus they give a system to knowledge and information.

2. They economise mental labour.
3. They retain continuity of knowledge and culture.
4. They make reasoning, inventing, discovering and researching possible.

JUDGEMENT

Thinking also involves judgement or decision. Judgement, though overlapping reasoning, is different from it. It is decisive rather than productive. Nothing new results in judgement. It is simply a "process of choosing among alternatives."

Many are the factors or independent variables that determine the formation of judgement. These factors may be many facts, experiences, hopes and fears, which one is not even aware of.

Thus judgement is a matter of organization, organization of the facts, experiences and beliefs.

Judgement, like perception, operates within a figure-and-ground pattern, in a "frame of reference or context". What is good or what is bad, what is moral or what is immoral is judged in the famework of customs and traditions of a particular society.

INDIVIDUAL DIFFERENCES IN THINKING

People differ from one another in thinking. Some people think better than others. This difference is due to the following factors.

Knowledge

Store of knowledge and information and the background of experience determine the quality, the content, ease, economy and efficiency of thinking. Greater the store of knowledge, better will the thinking be.

Intelligence

Intelligence is always an asset to good thinking. As intelligence differs from individual to individual, so there are found differences in their thinking too.

Attention

Cocentration or control of attention is the third factor. Due to differences in the types of attention the people have, there are caused differences in thinking also, e.g., rigid minds perseverate along one fruitless line of attack, scatterbrains do not exhaust the possibilities of even the first good lead.

IMAGINATION

Fluency of imagination also causes differences of thinking in the individuals. Good thinking means a good fluency of imagination, a good "ability to dream up new ideas".

EFFECTIVE THINKING

Let us first know what are the common factors that drag us into incorrect thinking. They have been described as :

1. *Wishful thinking.*

Our wishes, prejudices, desires and needs force us to think in the ways of their own satisfactions. This results in an incorrect and impartial thinking :

2. *Lack of control of factors.*

There may be a number of variables of consequence. Failing to control all these may result into fallacious thinking.

3. *Motivation.*

All thinking activity is pushed forth by some kind of motivation. Incorrect thinking, therefore, results when either there is no motivation or undesirable motivation.

4. *Atmospheric effects.*

Certain unrecognised and unconscious factors, too, lead to believe in certain false conclusions.

5. *Habitual methods of attack.*

People happen to learn certain methods of attack which become habitual. Those, then, restrict right thinking.

In order that right thinking may take place one must be made conscious of these factors and our effort should be to check them. Secondly, following conditions are necessary :

1. Wide range of knowledge,
2. Strong motivation,
3. Constant general interest,

4. Alertness and flexibility,
5. Period of incubation,
6. Sufficient time, and
7. Freedom from false assumptions.

In this way thinking may be properly and rightly guided.

QUESTIONS

1. Give the general nature of thinking and show what is its importance in the life of the individual.
2. What is Problem-Solving and what are various steps involved in thinking by Problem-Solving.
3. What do you understand by Reasoning and Creative Thinking ? What is their importance in education?
4. What is a concept? How concepts are formed? Discuss their educational significance.
5. What are various factors that lead to incorrect thinking? How can you help the pupils in correct thinking?

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CHAPTER XIX

PERSONALITY : ITS NATURE AND DEVELOPMENT

ITS MEANING

Every individual is said to have a personality of his own which is unique and distinct from every other personality. It is difficult to define personality. It is one word but many things. Dashiell says it is a "system of reactions and reaction-possibilities in toto as viewed by fellow-members of the society. It is the sum-total of behaviour-trends manifested in his social adjustments." It does not exist as an entity by itself. It is one's "habitual modes of response". In other words we can say that it is "the sum total of our ways of behaving, especially toward others." It is unbelievably complex, the result of life-long experiences and influences. Allport considered personality as "a person's pattern of habits, attitudes and traits that determine his adjustment to his environment." Behaviour is moral and it can be broken into atoms. These atoms may be said to be certain characteristics of the organism that become permanent with the individual. These habitual characteristics of the behaviour determine the quality of man's personality. It is a "marvellously intricate structure delicately woven of motives, emotions, habits and thoughts into a pattern that balances the pulls and pushes of the world outside." It is the whole person who acts, loves, suffers, fights and dies. An individual's dealing with his environment has a quality, an individuality of its own. Every one of us has a quality of behaviour. This total quality of one's behaviour is what we mean by personality.

ITS DEVELOPMENT

By the development of personality means "the development or growth of habitual tendencies which are excited by social stimuli". "Personality-development is a process of developing substitute stimuli and substitute responses in place of original or in place of earlier stimuli and original or earlier response-tendencies."

FACTORS AFFECTING DEVELOPMENT

There are innumerable factors that affect the development of personality. "Personalities, like oak trees, take shape slowly." The following are the most important factors in which lies the origin of personality :

1. Heredity.
2. Environment.

Heredity provides the individual with a fund of potentialities and certain organismic conditions that determine, to a large degree, the type of his personality. Hereditary factors may be summed up as constitutional, biological and physiological factors.

Environment is also a very potent factor in the development of personality. Personality is nothing but an "organism-in-an-enviroment." Let us consider them separately in details.

1. *Constitutional Factors*

The constitution of the body is said to be an effective factor in determining the type of one's personality. Earnest Kretschmer, a German psychiatrist distinguishes three 'body-types' of personality, (i) the "pyknic" is short and stout, (ii) the "Leptosome or "asthenic is tall and thin, (iii) the "athletic" is muscular and well-proportioned.

2. *Chemical or Glandular Bases*

The biological basis of behavior makes some aspects of behaviour consistent. The nervous system, the glands and the blood chemistry largely determine the characteristics and habitual modes of behaviour. These factors form the biological basis of personality. Berman has shown that glands are tremendously important as they regulate personality. According to him "adrenal personality" is vigorous, energetic, persistent and efficient. Adrenal women have masculine traits, and excel as administrators. Their secretion 'adrenalin' intensifies bodily reactions. They exist near kidneys. Lack of their secretion results in the lack of energy, irritability and indecisiveness. They are aroused by an emergency.

Endocrine glands secret "hormones" or the "exciters' into the blood. Co-operation between these is very important. Pituitary gland, existing between the brain and the roof of the mouth, sees that they are working in harmony. It influences our emotions. Its first part governs our bony structure. If it works overtime, the person will become a giant. The other part is connected with the proper working of the digestive and reproductive organs. Thus mental and physical conditions are to a very great extent dependent upon the normal working of this gland. Berman describes two pituitary personalities—prepituitary and postpituitary. The prepituitary type, caused by its anterior-lobe-over-activity, is predominantly masculine. Post-pituitary caused by the over-activity of the posterior lobe is excessively feminine.

The thyroid gland in two parts exists in the base of the neck in front on each side. Excitability and nervousness result from the over-enthusiasm and over-activity of this gland. Deficiency in thyroid gland leads to sluggishness in mental activity, lack of initiative and concentration of attention. Berman says subthyroids are under-developed physically, lustless, dull and susceptible to disease. Hyper-thyroids are restless, energetic, keen and impulsive.

The thymocentric personality dominated by the thymus gland in the upper chest is physically fragile, uninhibited, often abnormal sexually and criminal in tendency.

Thus, no psychologist denies that abnormal glandular conditions seriously affect personality.

Alfred Adler points out that physical factors do not affect personality directly. They affect it indirectly. As a result of physical handicaps a "feeling of inferiority" develops which gives rise to an attempt to compensate for the defects. The whole personality may be affected by this mechanism of compensation.

SOCIAL OR ENVIRONMENTAL FACTORS IN THE DEVELOPMENT OF PERSONALITY.

Sociologists and anthropologists stress the importance of environmental factors in the personality-development. John Dollard of Yale University believes that "personality is shaped by and interwoven with the social environment." Lawrence K. Frank says that "Culture is the ground from which personality emerges." All behaviour-patterns are cultural products. Important among them are moral ideas, social attitudes and interests. William James and Baldwin have noted how a child's early social contacts help to build his 'self' or 'social self', later termed "personality". Cooley says that "selfhood" or personality which is just a bundle of ideas, attitudes and intelligence depends a good deal on the people with whom the individual constantly associates.

Thus, a number of environmental factors react upon the organism of the individual and ultimately give a quality to his personality. The home atmosphere, the parent-child-relationship, the school environment, the teacher-pupil relationship and other politico-economic factors exert a great influence upon their personality development. Teachers influence their pupils a good deal directly or indirectly. Education affects student attitudes. The important values of a culture are stressed in its educational system.

TRAITS OF PERSONALITY

Personality is viewed in terms of what are called traits or dimensions. Psychologists are busy in grouping the most common traits together in order to give an objective description of personality. Allport brings them under the following five heads:

1. *Intelligence*

Intelligence is hereditary and exercises a great influence in determining one's personality make-up.

2. *Motility*

It is an innately determined characteristic which refers to one's general activity-level, his speed, impulsiveness or control and steadiness etc..

3. *Temperament*

It is also innately determined. It refers to the emotional level of a person, the "factor of general emotionality" in the words of Burt. Moods, attitudes and sentiments, too, may be included under this head.

4. *Self-expression*

It refers to the adjustment of the individual to his environment. Under this come all the peculiar reaction-patterns of the individual to his society and fellow-beings and his surroundings.

5. *Insight into oneself*

It is "individual's capacity for looking at himself objectively", to see himself as others see him. It helps the functioning of the trait of self-expression.

6. *Sociality*

This represents an individual's susceptibility and social stimulation. Some people have greater sensibility to social approval or disapproval. Others may be found callous.

The most important aspect of personality is temperament. Different types of temperaments have resulted into different types of personalities. Galen gives the following types of personalities on the basis of temperament :

1. *Phlegmatic type*

The individual having phlegmatic temperament lacks in general emotionality. No great person has been of phlegmatic temperament. This type of temperament corresponds to Burt's unemotional or "apathetic type".

2. *Melancholic type*

This corresponds to Burt's inhibited or repressed type.

3. *Sanguine type*

This corresponds to Burt's unstable type.

4. *Choleric type*

This type corresponds to Burt's unrepressed type.

Burt holds that persons cannot be exclusively classified under these heads. Majority of the cases belong to the mixed type. Thus, there is a considerable overlapping of these temperaments.

A newest division, Introvert and Extrovert has been made by Jung. McDougall also accepts this division.

THE INTROVERT

The introvert has been described by Jung as a person who dwells in the inner world and is indifferent to the world outside. The typically Introvert is "inwardly sensitive but outwardly quiet". He is engrossed in fantasy. He is self-controlled, self-centrered and self-absorbed. McDougall holds that "In Introverts there is an excess of brain-activities of the highest level on which self-conscious reflection and control of lower-level-processes depend." To him, the Introvert corresponds to the asthenic group of emotions and impulses which include self-submission, tender emotion, fear, sorrow and disgust. The Introverts have been found mostly to be withdrawn, timid, thankless, secretive, rigid, cold-hearted and pessimistic.

THE EXTROVERT

Jung describes the Extrovert to be objective and adventurous. The typically Extrovert, Burt says, is unrestrained and aggressive. McDougall holds that the Extrovert readily goes into action and expression stimulated by an effective urge without the modification and control of it. The Extrovert is a man of action. He does not speculate and brood over but enjoys the objective world. The Extroverts have been generally found to be co-operative, adventurous, grateful, friendly, frank, adaptable and optimistic.

McDougall holds that purely Introvert or purely Extrovert are hard to be discoverd. The majority belongs to the mixed type.

Several types of personality-make-up have been distinguished from the point of view of various traits that determine personality. Each type is a complex of various other traits and characteristics. Psychologists have attempted to give comprehensive factorial analysis of personality. They have discovered various factors and traits that determine personality.

Webb's study of the Training College students revealed that the personality-make-up of the boys showed not only the 'g' factor but also the 'w' factor, the persistence of motives or will-power. Garnett added one factor more, the 'c' factor which to him meant 'cleverness' including humour, cheerfulness and originality. Cattell afterwards discovered two factors more, 'm' (maturity) and 'a' (adjustment). Thus personality was discovered to be made up of 'g'+'w'+'c'+'m'+'a' factors.

MEASURING PERSONALITY

Following devices and methods are used to measure personality and its various traits:

1. *Observation Method*

In this the experimenter has simply to observe the behaviour of the individual. If he finds that good traits are present in his behaviour he tries to know to what degree they are present in him. Thorndike's and Jersield's studies are famous in this line but this device needs much time and is liable to error.

2. *Case-History Method*

In this the experimenter has to investigate into the past as well as the present activities of the individual. He has to find out the likes and dislikes, emotional status, sentiments, motives etc. of the individual and in this way he has to judge the personality of the individual.

3. *The Interview Method*

Studies of BINGHAM, SYMONDS and CRAWFORD and WOODWORTH are very famous in this direction. Interview method should follow a definite scheme and the aim should be to elicit relevent information and not to harass the candidate.

4. *The Questionaire And Inventories*

These devices are used to elicit interests, attitudes, opinions and abilities from the candidates themselves. In this, a number of printed questions are distributed to the candidates and are answered by them. Through these answers we judge the personality. But the experimenter should take precaution that answers are just and honest and that the candidates do not hide anything.

5. *The Rating Scales*

It has various types

1. Direct Rating.

It means assigning a number or mark directly by the experimenter.

2. Graphic Rating.
3. Man-to-man-type.
4. Guess-who-type.
5. General Behaviour Rating scales.
6. The Objective Tests.

There are objective tests for temperament and dispositions. Various such objective tests are available:

(*a*) *Miniature-Situation-Tests* for persistence and morality: These are controlled situations placed before the individual, e.g. Cody's measure of incorrigibility to dot a circle with eyes shut up.

(*b*) *Fluctuation of Attitude Tests.*

(*c*) *Suggestibility Tests*, e.g., Body-Sway-test.

(*d*) Cattell gives tests of aggressiveness and endurance.

6. *Physiological Approach*

The following apparatus is used to measure various physiological conditions:

(a) Sphygmograph

To record pulse rate.

(b) Plenthysmograph

To record blood-pressure.

(c) Electro-Cardiograph

To record heart's contraction.

(d) Pneumograph

To study breathing-curves.

(e) Psycho-Galvanometer

To study chemical changes in the skin.

7. *Projective Technique*

Projective technique is very important. It will be discussed in details.

7. PROJECTIVE TECHNIQUE

MEANING

Its title is derived from projection, meaning reflection of one's own innerself upon the external objects. Freud was first to use this word. To him perception of the outer world is determined largely by the feelings, desires, fears, thoughts and ideas of the inner world which is unknown. This is based upon depth psychology, the psychology of the unconscious. According to it the quality of personality is much affected by the unconscious motives and emotions. We must measure this depth of personality below the forbidden crust of consciousness. Conscious mind is only a segment, a part of our total personality. The conscious mind derives its strength from the unconscious mind.

To test the whole personality we must have some technique to measure and elicit this unconscious and depth-character of personality. Projective technique makes this possible which according to Warren is a tendency "to ascribe to the external world repressed mental processes". Through this technique is let out the hidden quality of the personality. This tells us as what lies at the back of our conscious behaviour. Thus certain unconscious dispositions that determine behaviour and the quality of the personality are disclosed and we have an idea of the type of personality one has.

KINDS OF THE PROJECTIVE TECHNIQUE

Following are the devices used in Projective Technique:

1. *Dream-Analysis*
2. *Free Association*
3. *Completion of sentences*

   It was introduced by Pyane in 1928.
4. *Story-telling*

   It is used to elicit the hidden and unconscious wishes, ambitions, fears, judgements etc. This method was elaborated by Poffer and Despert.
5. *Story Completion*

   It was first introduced by Lewis, but afterwards was fully developed by Sargent.
6. *Visual Tests*

   Under this come

   (a) Thematic Apperception Test. (T.A.T.) First conceived by Morgan it was developed by Murray in 1935.

   (b) Rorschach Ink-Blot-Test—It was standardized by Prof. Herman Rorschach Swiss psychiatrist. This test consists of 30 pictures, ten for men and ten for women and ten for men and women both. Out of 700 pictures he selected only 30 which are standardized.

   (c) Cloud-Picture-tests.
7. *Expressive Movement Tests*

   This is a technique to judge personality through

   (a) Hand-writing.

   (b) Painting.

   (c) Picture-Completion-Test.

LIMITATIONS OF THE PROJECTIVE TECHNIQUE

Following are the limitations of the Projective Technique:

1. There is a great dirth of standardized tests.
2. They are more subjective.
3. There is in them a difficulty of interpretation.
4. There is no proof of their validity.

Hence it is doubtful if they can be used widely and without expert knowledge.

QUESTIONS

1. Give an account of the psychological nature of Personality and discuss how it develops.
2. What are various traits of Personality ? What types of personalities are distinguished by Galen on the basis of temperament ?
3. What do you understand by the 'Glandular Basis' of Personality ? What are other factors involved in the development of Personality?
4. Write notes on:
   (a) Extrovert (b) Introvert. Discuss their bearing in Education.
5. Discuss all the devices and methods of measuring Personality.
6. What do you understand by 'Projective Technique' and what are its various kinds?

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CHAPTER XX

INTEGRATION OF PERSONALITY,

PERSONALITY ADJUSTMENTS AND PERSONAL HYGIENE

Nature of Adjustment and Mal-adjustment

Life is a long continuous activity of adjustment to the social and physical environment. Every living organism right from its emergence to its disappearance strives to adjust itself to the surrounding conditions. The individual is born in society and lives in society. The society provides him with an environment of a particular type "which has its own tempo and own peculiarities". The process of adjustment to this particular type of environment begins at the first moment of his life's emergence. The child strives to adapt to his surroundings. But there are situations in which his needs are thwarted and the adjustment fails. He gets maladjusted and a state of disharmony gets in between the child and the environment.

Well-Integrated Personality

Personality is described to be a bundle of numerous trait sand abilities. It has various dimensions like feelings and emotions, perceptions and attitudes and conations. A well-intergrated personality must achieve a balanced co-operation of all these dimensions. All the traits must be equally well-developed in order to function in unision. Personality is a unity in diversity. All its diverse characteristics while functioning must function as one single unit. Such a personality is said to be well-integrated. Thinking, feeling and doing all must work in harmony. None of them should fall in conflict with the other. If one thinks one thing, say that he must sacrifice for others and feels otherwise, say that he is dominated by the instinct of acquisition and self-interest, his personality will always remain split-up and in conflict. Hence, in a well-integrated personality feelings, emotions, desires, instinctive forces and other motives, knowing and doings are all kept under control and balanced organization. There is no conflict between any two of them.

A well-integrated personality is quite well-adjusted to his environmental and social conditions. He is socially well-adjusted. He does not complain of, criticise or fall against his fellow beings or social traditions and conventions. He bears with all easily and calmly.

A well-integrated personality develops gradually from the childhood stage in response to proper environment and guidance.

The process of adjustment is continuous and complex. It depends upon an organization of a number of interacting elements within the individual. It is the total personality which must be considered in the study of adjustment. A well-adjusted person is one"who is happy, free of all complexes and worries and efficient in his surroundings." To make it more complete a "well-adjusted person is one whose needs and satisfactions in life are integrated with a sense of social feeling and an acceptance of social responsibility."

Thus, the mechanism of adjustment involves a satisfactory and successful interaction between two kinds of forces—the subjective and objective, the innate and environmental. The individual is a bundle of drives, impulses, urges, motives, cravings, desires, wants and wishes etc.. When any of these is aroused, a particular state of tension is created in the organism of the individual. This state of tension is removed by a particular activity which satisfies the need of the individual. This activity may be called a goal-activity. When this goal-activity is thwarted, the process of adjustment takes a new turn. Normal mental functioning is arrested and there appear mental disorders and diseases and mental disturbances, upsets and abnormalities. At one time or another individual wishes, interests and convictions are bound to collide with those of others around him. There may be clash between his own self and the environment. This may cause a clash within his innermost self. This may result in some kind of disorder of adjustment. The personality becomes maladjusted.

Thus, maladjustment is caused by two factors, the inability or certain incapacities and inherent defects of the individual and, secondly, by the stiff conditions of the environment which are hard to be overcome.

SOURCES OF MALADJUSTMENT

The sources of the individual's conflict or maladjustment are his inner drives and needs. There are two important sets of these—the organic and the personal. Air, food, liquid, water, rest and sleep which are necessary for the maintenance of the organism are the organic needs. Affection, belongingness achievement independence, social approval etc., are his personal needs. Besides, there are wants for security, desire for personal worth, "ego-value," want for freedom and sexual urge. All these wants and desires can not be fulfilled. When not fulfilled, frustration, maladjustment and disorders appear.

The frustration or the thwarting of needs comes from two directions—internal and external. It remains internal if it is due to some personal defects or limitations or moral ideals. It is external if it is caused by certain environmental conditions such as social restrictions, economic difficulties and political factors.

The intensity of thwarting or maladjustment depends upon the (a) type of thwarting, (b) previous experience of the person, (c) person's interpretation of it, (d) the source (personal or impersonal), (e) nature of the need, (f) possibilities of satisfactory solution, and (g) degree of awareness of being thwarted.

In adjusting to life-situations the individual feels the necessity of harmonizing his desires with reality. But very often it is not possible. The individual, therefore, must learn either to accept defeat, to try another or to undertake long and arduous process to reach his goal. The failure to accept certain aspects of reality is a frequent source of continuing conflict for many individuals.

The individual has several desires which are in conflict. Very early in life children learn standards of right and wrong and acquire ideals of conduct which give rise to conflict between natural desires or impulses incompatible with the moral principles of the individual's conduct.

The evidence of maladjustment of personality is found in the resulting overt behaviour. Three broad types of behaviours result from maladjustment of personality, the aggressive, withdrawing and nervous habits. The aggressive behaviour, again, takes the forms of bullying, stealing, truancy, disobedience, defiance, insolence, destructiveness and temper-tantrums. Examples of withdrawing behaviour are shyness, fearfulness, day-dreaming, unsociability and secretiveness. Nervous habits include nail-biting, fidgeting, and thumb-sucking.

VARIETIES OF MAL-ADJUSTMENT

The following are a few types of personality adjustments. They are important in the study of mal-adjustment.

1. COMPENSATION

Compensation is an attempt to cover or offset a feeling of being inferior. Some compensations consist in unsocial behaviour, some in building up strong suits to cover weak ones. Bullying or blustering and the tendency to show off are frequently overcompensations for feeling of fear, shyness and lack of confidence.

2. RATIONALIZATION

"The process of self-justification is termed rationalization." This is the denial of the real motives of behaviour and putting in place of it "reasonable-sounding Justifications". This is a "sour-grape-saying".

3. DAY-DREAMING

In day-dreams one overcomes his weaknesses. We try and get for ourselves in day-dreams what we do not have in reality. Continued failure may seek in the world of imagination those satisfactions which have been denied to one in the real world. He avoids to face reality and seeks refuge in the world of imagination.

4. PROJECTION

It is referring to others' faults which are our own.

5. IDENTIFICATION

This is imagining ourselves to be undergoing the experiences of another person.

6. REGRESSION

It is just a return to more childish or infantile behaviuor after reaching the stage of mature behaviour.

7. NEGATIVISM

It is a tendency to do just the opposite of what is required.

8. WORRY OR ANXIETY OR OVER-CONCERN OR PHOBIAS

These are unreasonable fears.

9. REPRESSION

Frustrated desires may be repressed. Repression results in complexes. A complex is an "emotionally toned thought". The complex may be pleasant or unpleasant. Complex may develop about anything. Inferiority or superiority complexes are the complexes about the self. Repressed complexes are like so many slivers in the body. Sliver is touched, pain is felt. Complexes should be removed like slivers to avoid more troubles. They should be brought out of the sub-conscious. The best way to remove them is to talk them over with some one.

Complexes are the contribution of the psychology of the unconscious. According to Freud the unconscious has greater influence on our conscious life. He referred to the unconscious process which never rises to consciousness unless dragged up by a process of psycho-analysis. He held that unconscious desires and impulses constantly lead to irrational conduct without our being aware of it. An undoubted fact about it is that repression caused by some mental conflict results into certain mental complexes, which play a great role in the determination of behaviour and development of personality.

Complex is usually defined as "an impulse or an idea or memory of an experience togetr with the associated feelings or emotions which have been repressed to the exten of complete forgetting but which continue to influence conscious experience and action at times". Vallentine says, "It is, I think better to extend the term to ideas or impulses and their associated feelings which are not quite forgotten."

Thus, the intensely emotional experience can be repressed to the extent of forgetting, and yet can continue to influence mental life. Repressed ideas of such experiences and its associated feelings and impulses are called a complex.

CONFLICT, REPRESSION AND COMPLEXES

CONFLICT

Conflict is always a conflict of incompatible motives—motives that impel us to incompatible goals. When there are two strong desires or motives simultaneously impelling the individual to work in two opposed directions, a state of indecision follows. This we call mental conflict. This is the state of the mind divided against itself. In psycho-analysis, a mental conflict between motives may result into repression of desires and motivational forces. Every individual is a bundle of instinctive urges, many of which can not be allowed to have direct satisfaction as our society has its own code of conduct. None can have direct satisfaction of sex-urge. None can seize other's things. Everyone can not be rich. Everyone can not have good building. Thus, those who can not, have to repress their desires which are not fulfilled. Tensions, over-assertion, sex, curiosity, acquisition etc. cause conflicts.

In short, the life of the individual is full of conflicts. We can not drink publicly, we can not love other women in the presence of the wife, we can not have riches to our heart's content, we can not all be kings and rulers, we can not all have decent clothes and high posts. As a result of this, constant conflict goes on in the life of the individual. But such conflicts are not very harmful. These are conflicts on the conscious level and many of them are easily resolved. A conflict of motives faced and resolved does not in itself result in mental disorders or any other harm. If the continued conflicting motives are recognised and openly acknowledged they do not produce disorders. Danger of disorder comes when the contending motives work obscurely, unrecognised by rationalizations i.e. reasons which we invent to explain and excuse. Danger comes when we repress the conflicting motives. Thus, it is not conflict but rather the repression to which conflict may lead that is the great source of mental disorders.

But conflict itself is very painful and wasteful of energy. It may weaken and reduce the human organism and prepare the way for disorders. If the conflict continues sub-consciously it is still more distressing and exhausting to the individual. His energies are consumed. He suffers from the symptoms of lack of energy complicated by an unknown distress. He is restless and distressed, sleeps poorly, can not concentrate his attention, suffers headache and weakness of the eyes and pains about the body.

It is, therefore very necessary for the educator to avoid situations that cause conflict in the minds of his pupils. He should educate them to consciously recognise certain conflicts such as all can not be rich, or can not be big etc., so that they may not create mental conflicts. The discipline should not be rigid and repressing as it also creates conflict in the minds of the students.

REPRESSION

Repression is nature's crude way of dealing with conflicts. When a situation of conflict arises, it is painful and can not continue indefinitely. The individual, therefore, tries to get relieved of the tension. He makes adjustments. One way of adjustment is to repress the conflict. What is not liked is sent forcibly out of consciousness. It , then, goes to the subconscious or unconscious mind and continues to influence our behaviour. Repression is a continuing activity of the mind.

Wishes, desires, experiences and events may be repressed and sent to the unconscious mind. These repressed memories and affects do influence human behaviour, though one may or may not be conscious of this. Many of our likes and dislikes are formed in this way. Strong aversion to taking medicine may be due to very early experience when bitter pills were forced down the throat of the child.

Repressed wishes of the unconscious mind remain always active and try to find an expression in dreams, mental disorders such as fears, anxieties, neuroses and other abnormalities.

Vallentine holds that the term complex should include even ideas and impulses which are not completely forgotten, but simply dissociated.

Charles Fox says that complexes are the "events which have the "Id quality". The 'Id' refers to repressed wishes, forgotten experiences and all the primitive instincts which have not found, yet, an expression—"instincts charged with energy and ready to explode but kept down by the censor". The 'Id' is dominated by the "pleasure-principle" and takes no account of consequences of action. The 'Ego' is dominated by the "reality-principle" and the 'super-ego' by the image of those we fear or revere or whom we have identified with our own personality.

Freud says "Goaded by the 'Id' hemmed in by the 'super ego' and rebuffed by the reality, the ego struggles to cope with the task of reducing the forces and influences which work in it and upon it to some kind of harmony. When the ego is forced to acknowledge its weakness, it breaks out into anxiety, "reality-anxiety" in the face of the external world, moral anxiety in the face of the super 'ego' and neurotic-anxiety in face of the strength and passion of the 'Id'. What complicates the struggle is the complexes, "powerful determinants of action but completely unconscious".

Charles Fox holds that there is nothing "essentially morbid about complexes". They may be regarded as a "constellation of physical elements having their centre in a common emotion with definite conative trend". Thus, it may be just a "persistent idea or group of ideas coloured with a strong emotional tinge", something like sentiment as defined by Shand as "an organized system of impulses centred round some object".

SENTIMENT *vs.* COMPLEX

1. The sentiment is perfectly healthy and normal mental product reducing to order and disciplining the emotional life.

Complex has a certain irrationality both as regards the emotion as well as its impulse.

2. The complex is not completely integrated with man's personality, while sentiments form an integrated personality.

3. Complex disables an intellect from functioning normally, while sentiments do not.

4. The person refuses to entertain ideas in conflict with the central thought of the complex e.g., the materialistic complex-minded person refuses to see any evidence of spiritual forces.

Freud defines complex as "a circle of thought and interests of strong affective value, of whose influence at the time nothing is known to the subject." To him it is an unconscious product. Repression causes complete dissociation of complex from the rest of the mind which works as "functional autonomy".

UNIVERSAL COMPLEXES

Inferiority complex is a universal complex. Adler's Individual Psychology says that, in this, consciousness of the weak points dominates the neurotic.

Superiority complex, too, is a universal complex. It is either due to inferiority feelings or due to actual and endowed superiority.

THEORIES OF MENTAL CONFLICT

Various theories have been put forward to explain the nature and causes of these conflicts. They are :

1. THEORIES OF CHARCOT AND JANET

Charcot and Janet developed a theory that severe conflicts such as hysteria are caused by "dissociation" or imperfect integration of personality. A normal personality is a well-integrated personality. When 'internal divisions' appear and personalities are split, some kind of mental conflict or disorder takes pace. Janet said that neuroses arise from constitutional weaknesses and lack of energy. Fears, obsessions and compulsions all are due to the weakness of the mind. He used the term 'psychosthenia' for this 'weakness of the mind'.

2. Psycho-analysis

(*a*) *Freud's Theory*

Freud said that neuroses have a psychological basis. He held that the unconscious mind, "the greatest segment of the mind" controls the largest fraction of human behaviour. The 'consciousness is just a flickering light given off by the unconscious mind'. This unconscious mind is the reservoir of primitive impulses and strivings and socially disapproved or forbidden desires. These desires always strive to come to the level of consciousness. But the human being (his conscious mind) represses them, as not being desirable, producing, thus, mental conflicts. These conflicts, if serious enough, result in neuroses.

The content of the unconscious, as Freud holds, is generally sexual in nature. This he calls 'Libido', the life-urge.

A conflict according to Freud, thus, is an inconsistency between his primitive animal-like 'Id' and the demands of 'reality'. To resolve these the individual adopts various devices. This he calls 'dynamism'. Such important devices are 'repression'. 'Sublimation', 'rationalization', 'projection', 'regression'.

The treatment suggested by Freud requires first, to understand the patient's conflicts by "free association" and dream-interpretation and then to free the 'Libido' from its unfortunate fixations and to build up the 'Ego' until the patient can cope with his problems.

(*b*) *Adlers Theory*

Adler, a disciple of Freud opposed the distinction between the conscious and unconscious as drawn by freud. He also disliked the idea of putting emphasis upon sex. He set up a rival school called 'Individual Psychology'.

He said that it is no sex-repression that causes neurotic disorders and mental conflicts, but it is 'thwarted self-assertion'. Adler holds that the basic urge is a striving for superiority. When this urge is thwarted the person feels inferior and an 'inferiority complex' results. The individual then tries to compensate by asserting himself in other ways.

Thus according to Adler first 'style of life' or 'the role which the individual adopted in early childhood' should be discovered. The inferiority complex, then, should be talked over and the individual should be made aware of the fact. Then he should be guided towards goals more socially acceptable.

(*c*) *Jung's Theory*

Another disciple of Freud, Jung set up in Zurich a school of 'Analytical Psychology'. Jung said that it is not only the sex that dominates the life, but there are various other desires, too, which motivate the behaviour. The 'libido' is not only the sex-energy. But it takes many forms. He also said that 'the unconscious is not entirely unmoral'. It also included moral and even religious principles.

To Jung, neuroses are caused partly by complexes built up in childhood and partly by the present difficulties.

Free Association and "dream-analysis" are the techniques which he suggests to cure neuroses. His analysis deals with both past and present. He makes a synthesis of both conscious and unconscious trends of personality.

(*d*) *Horney's Theory*

Karen Horney, a psycho-analyst of New York says that 'conflicts and neuroses do not arise from instinctual or biological sources', as Freud generally implied. They are produced by the contradiction in our culture. For example, we are taught brotherly love and unselfishness, but competition for success is also stressed in the society. Out of such conflicts come hostilities, fears and other neurotic symptoms.

THE TREATMEMT

The treatment of the mal-adjusted individual requires that all available information about the individual's past and his environment should be collected and an intensive examination of the individual himself should be made. The following procedure is made use of:

1. THE CASE HISTORY

The case-history is the 'summary of the fact-gathering investigation'. It is the data including the social history of the individual and his personal, developmental health, school and work conditions together with an account of his home and family background.

2. THE PHYSICAL EXAMINATION

A detailed physical examination of the individual is also made.

3. THE PSYCHOLOGICAL EXAMINATION

The individual is administred various intelligence-tests and achievement tests. Achievement tests in various school subjects are administered to find out if there is any disability in reading, arithmetic, or spelling etc. Visual and auditory tests may also be given. Tests of emotional attitudes and other personality tests are also administered.

3. THE PSYCHIATRICAL INTERVIEW

This is an interview held between the psychiatrist and the patient. Through this, the psychiatrist tries to gather information about the patient's own point of view, his difficulties and problems, his attitude towards parents, teachers, siblings and other companions. Through suggestion it is brought out whether the patient is giving real reasons or he is trying to evade issues.

4. THE STAFF CONFERENCE

A conference of the various members of the clinical staff is held in which each specialist puts his own opinion about the patient from his own point of view. Thus, different factors collected from different viewpoints and referring to different aspects of the patient's personality are pooled together.

5. TREATMENT AND FOLLOW-UP

Then in the end suggestions for treatment are given. A follow-up study is also made of the patient to examine and review the progress. Cumulative records are also prepared.

6. THERAPEUTIC PROCEDURES

The treatment of the mal-adjusted person is an individual matter. Each patient should be treated as an individual, having his own causes, conditions and the history of the case. So it should be treated individually. Under this treatment,

1. Change of physical environment is necessary e.g.,
    a. placement may be modified.
    b. Hobbies should be encouraged.

2. A psychological change in the environment is also necessary. It involves the attitude of the parents, teachers and others with whom the patient associates. It should be made favourable.

3. A change in the attitude of the patient about his ownself, own behaviour and problems is also necessary.

Thus, the treatment of the mal-adjusted individual is a process extending over a period of time rather than as a process of single treatment or conference. It varies according to the seriousness of the mal-adjustment.

MENTAL HYGIENE

Mental Hygiene is concerned with preserving good mental health. In other words it is the science of avoiding mental disorders. Its domain is knowing the causes of various mental disorders, locating various situations that can cause mental strains and disorders, suggesting precautions that might enable one to avoid such disorders and finally suggesting treatment of mental disorders. If one child is aggressive, aggressiveness being some form of mental disorder, mental hygiene will necessitate to know the causes and full background of circumstances that has led to such behaviour-formation. Thus, the science of Mental Hygiene is a study of maladjustments of personality and deals with the possible ways of avoiding such maladjustments as maladjustment is an individual as well as social nuisance. It studies the influences of poverty, competition, lack of affection, overindulgence, neglect of children, favouritism etc. upon the development and adjustment of child's personality. It has been found that often these influences lead to the development of neuroses and other severe mental disorders in children.

Mental Hygiene has influenced the school-program also. It is being recognised more and more that adjustment of the pupil to all school situations is very important. Thus, competitions, rewards and punishment, contents of the curriculum, proper adjustment of the teacher etc. are being studied from this point of view and efforts are being made to bring about the best possible adjustment between these situations and the child's needs. Mental Hygiene has changed the whole attitude towards school discipline. Mental Hygiene asserts that discipline should be positive and self-developed as negative and forced discipline leads to mental conflict and mental disorder.

EDUCATIONAL SIGNIFICANCE

Education is a social process which aims at fitting the individuals in the community or the society. It aims at socialising the individual behaviour. Thus, it makes a distinction between the biological behaviour and the social behaviour. The biological behaviour is "dynamic", "goal-seeking", and "purposive" in the sense that it is motivated by certain biological drives. But, the individual has to live with others and has to live according to certain rules of conduct which aim at enabling each individual to live happily. The desirability of this makes it imperative for the individual to meet the new situations and adjust accordingly. Thus, he is demanded to override the biological adjustment and to make social adjustment. Social adjustment is a conscious adjustment made by efforts. This conscious adjustment brought about by efforts as desired by society is the objective of education. But education aims at the adjustment of not this individual or that. It takes into consideration the adjustment of all the individuals.

It not only ensures adjustment, it also treats maladjustment. Education is not the gift of the favourite few. It is shared by all. It, therefore, should aim at bringing the maladjusted individuals back to a state of mental health and desirable adjustment.

The educator, thus encounters a heavy responsibility as the number of such mal-adjusted children is not small in schools and colleges. For proper adjustment of these children and saving from wastage the national man-power and mental energy, he should detect such cases, try to analyse them and treat them.

The knowledge of personality-adjustment and mental conflicts is of great significance for the teacher. It helps him in securing the adjustment of the behaviour of his pupils. It tells him the real causes of mal-adjustment and conflict which arrest the proper growth and development of the child's personality. It helps him in analysing the problem-behaviour of his pupil. For example "moodiness" on the part of an adolescent pupil is a sure sign of conflict within. So are day-dreaming, withdrawing, temper-tantrum, negativism, extreme indifference and sadness. All these are great hindrances to educational achievement, social and cultural development and personality-growth. The teacher should, therefore, know and try to remove them. In this, he is greatly benefitted by the psychology of personality-adjustment and mental conflict.

The adolescent has a tendency to lawlessness. This is due to certain strong emotional conflicts. The powerful sex instinct is greatly responsible for this. Many of his undesirable behaviours are motivated by these conflicts. The education of the adolescents, therefore, is a problem for the teacher. The teacher of the adolescent boys can achieve marvellous success if he works on the lines of the principles and knowledge of the psychology-of personality-adjustment.

Lying is a very common misdemeanour which causes great concern to the educator. Much of the school-boys' and college-boys' lying is due to mental conflict. "It is a disease of the mind rather than a moral fault." The "white lies" of the children are due to exuberance of imagination caused by a conflict between the world of fantasy and reality. Morbid lying of adolescents is always due to conflicts caused by repressed complexes. The teachers of the adolescent boys as well as small children should have a thorough knowledge of the adjustment of personality and mental conflicts. Only then they can understand such behaviour-problems thoroughly well. Understanding of these is essential for proper educational and personal guidance.

Thefts of school-children, not returning borrowed books, defrauding railway authorities, evading income-tax, attitudes of rebellion towards teachers and school authorities and hooliganism can be traced back to certain mental conflicts and repressed desires in the same way. Once the teacher gets at the right cause, he can easily remove it and put the pupil on the right track. This, of course, is a great achievement of the teacher which the psychology of personality-adjustment makes possible for him.

There are many instances in which unsocial behaviour can be traced to mal-adjustment. In order that teachers may be of the greatest possible help in preventing the development of untoward traits, it is essential that they may be able to recognize abnormal behaviour and maladjustment in its early stages.

The psychology of personality-adjustment is significant because it emphasizes the role played by the behaviour of the teacher as well as the parents and also the role played by the environmental forces. It implies that the environment should be so organized and the behaviour of the teacher should be such as the least repression is caused and that there are no chances for mental conflict, thwarting and frustration. The methods of teaching and the contents of teaching should be so adjusted as they may not cause mental conflicts. It also emphasises that the personality of the pupil should be respected at all stages of development. It also asserts that each individual should be studied in his entirety by the teacher and that the teacher should secure all possible conditions of proper development by the pupils removing all obstacles from their ways.

Thus, psychology of personality-adjustment is of high importance for all the teachers and educators.

QUESTIONS

1. How will you explain "Maladjustment of Personality"? What are its sources and how maladjustment can be avoided?
2. Explain Conflict and Repression and state what harms are done by them to the personality of the individual.
3. What is a complex? What is its significance in the personality-adjustment? What steps a teacher can take to avoid formation of complexes in his pupils?
4. Discuss various varieties of maladjustments and state how maladjustments can be treated?
5. What are various theories of conflicts? How conflicts render harm to one's personality?
6. What do you understand by "Mental Hygiene". In what way the school-program has been influenced by this science?
7. What is the significance of the psychology of the Maladjustment of Personality in Education? Discuss in details.

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CHAPTER XXI

INDIVIDUAL DIFFERENCES

"Human beings are not found anywhere in nature. There are only individuals. The individual differs from the human being because he is concrete event. He is the one who acts, loves, suffers, fights and dies. On the contrary, the human being is a Platonic Idea living in our minds and in our books." Thus, the individual is a particular being and the human being is a universal, a general being. It is, therefore, important to define and discover exactly the part of the human being and that of the individual. Educational Psychology is concerned with the individual. Indeed individuality is fundamental in man. It permeates our entire being. It gives uniqueness to the self.

Individuals can be easily distinguished from one another by their gestures, their ways of talking, acting and walking, their appearance. And these changes cause every man to be himself and no body else. Identical twins coming from the same single cell are two quite different persons. In the same way there are no individuals of identical mentality. The richer the personality the greater the individual differences.

Thus, it is an established fact that the individuals differ in mental abilities as well as in physical abilities and personality traits. The individuals not only differ from one another, but also each individual differs from one ability to another within his own self. Thus, there are variations not amongst individuals, but there are variations within the same individual among his own abilities. The problem of individual differences, therefore, can be viewed from two sides :

(a) Differences in abilities from individual to individual.

(b) Differences in abilities within the same individual.

EXTENT

There is no definite measure of the extent of the individual differences. It has been found that there is a continuous gradation from one extreme to the other. Freeman of Cornell University holds that the "nature and extent of individual differences in a particular trait or complex of traits is represented by the unimodal curve which portrays the range of human potentialities for development in that trait under conditions as they, now, are." We can not, therefore, say that all persons fall naturally into two distinct types such as atheletic or unatheletic, intelligent or unidtelligent etc. The only thing that we can definitely discover is the average (mean) uariation. This can reveal to us the extent of differences.

CAUSES OF DIFFERENCES

Thorndike discusses the causes of individual differences under five main heads. These are:

1. Sex.
2. Race or remote ancestry.
3. Family or near ancestry.
4. Maturity.
5. Environment.

Second, third and fourth factors have been discussed in details in the third chapter under the head 'Heredity and Environment'. As regards sex, it has been discovered that girls are superior to the boys in tests of memory. Superiority of females over males has been found in linguistic ability. Small differences have been found in favour of males in reasoning, computation, arithmetical ability and number concepts. Males are found to be superior in manual performance and mechanical ability.

However, there are also found great overlappings between the sexes.

According to these differences there have been found marked differences in interests, habits, preferences, educational and vocational emphasis.

As regards maturation, individual differences in the rate of mental growth are found in infancy. The rate of growth is not the same at all the stages. It differs from stage to stage.

Not only the rate but the character of growth, too, differs from one age-level to another as maturation marches on. Yet, the children tend to maintain their relative positions of mediocrity, superiority or inferiority.

Late in life, persons suffer from a decline in mental abilities. The decline proceeds gradually at first, then increases with age especially after sixty. But the relative position is maintained even now.

DIFFERENCES IN ABILITY

This has become an established fact that individuals differ widely as regards their I. Q's. The distribution of intelligence quotients obtained by examining first grade children with the Stanford Revision of the Binet Test had a range from 60 to 160 with 100 as its mean. Other tests of intelligence are used with groups at all levels and ages. The results so obtained go to assert that individuals vary greatly on the scale of mental ability.

Heredity and Environment are two great factors that cause individual differences in mental ability. Their effect upon mental ability has been discussed in details in the third chapter under the head "Heredity and Environment."

DIFFERENCES IN APTITUDES AND PERSONALITY

Individuals differ not only in mental ability, but they also differ in all other capabilities and abilities. They differ in memory, motor skills, sensory skills, height, weight, girth of head, girth of chest, imagination, thinking, reasoning, attention, general and specific emotionality, glandular reactions, interests, sentiments, ideals, attitudes and finally in adjustment to their environmental conditions and stimuli. All these differencial factors produce differences in the aptitudes and personalities that individuals happen to develop.

APTITUDES

When we speak of a person's aptitudes, we refer to his potentialities. They may be high or low, different in different fields. They vary from individual to individual. Aptitude of a person is one's ability to carry on a task to maximum success. It refers to one's special abilities. Scholastic aptitude pertains to potential learning ability. It is determined by one's intelligence. It is also called general aptitude.

But as individuals differ from one another in the degree of intelligence, there are bound to appear differences in their general aptitudes. It is a common experience that all people can not perform a particular activity with the same amount of ease and perfection.

Special aptitudes refer to the relative fitness of the individual for special types of work. But this "fitness" calls forth the requisite amount of various special abilities involved in the activity. But as individuals deffer from one another in the amount and degree of these abilities possessed by them, differences in their special aptitudes, too, appear.

PERSONALITY

Personality is not one single entity. It is a blend of a number of traits and abilities. But these traits and abilities and their integration and the process of their blending differ greatly from one individual to another. Therefore, we find differences in individual personalities. The individuals differ greatly as regards the physiological and biological conditions of their organs (the functioning of the glands, nervous system etc.) their psychological development and mental functioning. All these individual differences find a clear manifestation in the total differences in the individual personalities. When there are differences in the component parts of patterns, there will be differences in the whole patterns, too. Individual differences in intelligence, motility, sociality, temperament etc. result into differences in individual personalities.

Thus, individuals differ from one another and they differ within themselves from ability to ability.

METHODS OF STUDYING INDIVIDUAL DIFFERENCES

There have been two methods of studying individual differences:

1. *Cross Sectional Method*

In this a group of individuals is measured with respect to a given trait. The data are then arranged and analysed. Then the rank of the individual is determined in the group.

2. *Longitudinal Method*

But a single measure cannot speak of the entire individual. It does not give the whole picture of the individual. No trait exists in isolation within a person. Every trait is a dependent part in a large whole that acts as an unit. It is this whole which gives every person his uniqueness. For this purpose they employ the Longitudinal method. In this the same individual is measured and studied over a period of some years in respect to each of the variety of traits. This is also called a 'Case-Study' method.

Thus, the Cross-Sectional method discovers resemblances and differences among individuals. The Longitudinal method, case-method or "organized-individual-pattern" method explores more fully the individuality of each person.

The tools and instruments that are used to measure these differences are various kinds of tests e.g. Intelligence Tests, Aptitude Tests, Interest Tests, Personality Tests etc.

A thorough knowledge of the individual differences is essential because they serve as the foundation upon which effective pupil-guidance and good teaching can be built. They are often the source of one's most pronounced achievements, fullest self-realisation and greatest usefulness. They are the evidences that distinguish individuals from one another. They are useful for two-fold purposes:

1. Educational guidance.
2. Personal guidance and vocational guidance.

1. *Educational Guidance*

Educationally, individual differences mean that a pupil's chronological age is an unreliable criterion upon which to base his educational programme. As the individuals differ from one another, so their education, too, must essentially differ. Secondly, as the individual is not the same at all the stages of development and that he differs greatly with respect to his abilities at different stages and age-levels, so education should also differ accordingly at various age-levels. In other words human variability should be given due regard in the content and methods of education. "Every person is a well-defined type and that in each type certain fixed trait-relationship exist." Education, therefore, must be adjusted to each type according to these trait-relationships. This has resulted into following specific trends in education:—

(a) *Individualization*

"Individualization" in the words of Courtis "as a method of teaching or as a philosophy of education refers primarily to the attempt to adjust education to the nature of the individual." Individualization emphasizes the marked individual differences of human nature.

(b) *Homogeneous Grouping*

Individual differences compel to think in terms of homogeneous grouping of classes according to the level of ability and not age. This is also known as "ability-grouping".

(c) *Adjustment to special interests*

Individuals differ from one another as regards their interests. A great principle of learning is that education should take notice of the interests of the boys at all stages of development. This fact may be utilized in the adjustment of teaching to the special interests of the boys of various stages of development.

(d) *Assignment and individual differences*

The teacher should modify the assignment in amount, quality, difficulty and sequence according to individual differences. The individual differences in personality-traits, previous education, capacity and other factors must be taken into consideration to fit the work to the requirements of differing individuals.

The first Acharya Narendra Deo Committee of U. P. proposed a system of secondary education based on the variegated needs of pupils and said that the schools should provide diversfied curricula to suit the needs and aptitudes of our students. These recommendations are based upon the recognition of the "importance of individual differences in ability, intelligence and personality make-up of school pupils". The Acharya Narendra Deo Committee Report of 1953 says, "Aptitudes, intelligence testing and educational guidance are of prime importance in a widespread system of higher secondary education for a free and democratic country". The recognition of the fact of individual differences resulted into four types of courses —literary, scientific, constructive and aesthetic. "Course-analysis" like job-analysis has been stressed by the Committee." "Ability tests" and scholastic aptitude tests too have been recommended by it. All these are sound recommendations based upon the established fact of the individual differences. The same has been asserted by Mudalias Commission Report of (1954) on secondary Education.

2. PERSONAL AND VOCATIONAL GUIDANCE

Individual differences are of great significance for personal and vocational guidance purpose. On the one hand individuals differ from one another as regards their physical characteristics, general intelligence, aptitudes, personality traits, interests and likings, on the other hand there are differences in requirements of occupations. It is, therefore, essential that proper adjustment should take place between these differences so that the fittest man may go to a particular occupation and there may not be the wastage of national energy and genius.

Individual differences are of great importance for clinical and personal hygiene purpose. They differ in personality traits and other abilities. Hence there are differences in the adjustments that they make towards their environments. Deficiency of some traits in some of them may cause maladjustment which is to be avoided. The individual can be helped rightly only if we are able to know and measure the trait or ability that is responsible for this. Individual adjustments are to a very great extent determined by one's own abilities and traits. It is the duty of the schools, the home and the society to provide the individuals with an environment which suits their respective abilities and traits in order to avoid mental disorders. The psychology of individual differences gives an insight into adjustment—problems of the individuals.

QUESTIONS

1. What is the psychological nature of individual differences? Discuss the significance of this fact in education.
2. What are various factors that cause individual differences? What bearing does the psychology of Individual differences have on Education?
3. Discuss some of the important individual differences and state in what way they have influenced the educational program.

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CHAPTER XXII

DEFICIENCIES AND ABNORMALITIES.

It is impossible to find the children of the same age and sex who are alike in physical, mental, social and educational maturity in character-traits or in attitudes, temperament and disposition. Many children are found in schools who deviate mentally, socially, educationally or physically from the average child. This deviation may stretch on both the sides of average normality. Children may be superior or inferior as regards their mental, social, physical and educational equipment. Such deviating children constitute distinct problems from the standpoint of their education. When they do not stand on the same level with the average children, their education, too, can not be the same as imparted to the normal children. The first and foremost duty of the teacher is to adapt learning-process to the abilities, disabilities, interests, personality-make-up, physical, social and mental maturity of every child. Secondly, he bears a great social responsibility of preparing every child for good social-life. This reponsibility becomes even greater in case of deviating children, children who are below the average or above the average.

TYPES OF DEVIATING CHILDREN

Following are the various types of deviating children:

1. Mentally deficient children i.e. children born with low I.Q. which is below the average range 90—100.

2. Educationally retarded i.e. those who have educational disabilities or specific mental disabilities.

3. Socially mal-adjusted i.e. those who have different kinds of conduct-disorders such as emotional instability, trickiness, sluggishness, negativism, excessive egotism, jealousy, over-sensitiveness, bullying tendencies and so on.

4. Physical deviates i.e. those who are retarded in physical growth or those who have some physical defect.

5. Neurotics i.e. those who suffer from a kind of mental disease, neurosis.

6. Abnormals i.e. those who suffer from serious mental disease described in the next chapter.

On the plus side are those who are superior to the average, mentally, socially and physically.

OBJECTIVES

Following are the objectives of educational guidance and adjustment of the deviating children:

a. to enable them to achieve maximum success and satisfaction in their school-work.

b. to enable them to develop their mental, physical, social and moral powers to the highest degree.

c. to enable them to become well-adjusted socially and mentally and become worthy citizens of the society

PRACTICAL SUGGESTIONS

Following are a few suggestions that can help in achieving these objectives and getting success in the educational guidance and adjustment of the deviating children.

a. The college should have competent well-adjusted expert and emotionally and intellectually mature teachers on the staff. The teacher should have adequate training in the understanding of the physical and mental traits of the pupils. The school should be child-centred.

b. Special classes should be started under competent teachers for each category of the deviating children.

1. MENTALLY DEFICIENT CHILDREN

(children having an I.Q. on the range from 35 to 65 or 70)

According to Burt low 'g' has been found to be the major cause of backwardness. This kind of backwardness is irremediable. The only thing one can do is special arrangement for the education of such children. Special classes should be opened for them. These classes should provide a differentiated curriculum and corrective work. The teaching should be made concrete and most simplified. There should be sensory-motor kindergarten and "doing" activities.

For those children who stand on the border-line of mental deficiency i.e. on the range from 65—85, also, the curriculum should be as varied and flexible as in the classes for the mentally deficient, but more attention should be paid to the literary branches. Some of these children may ultimateley prove to be deficient while others may be restored to the normal grade.

Thus, the slow, average and bright pupils should be put in separate sections.

2. LACK OF SPECIFIC ABILITY

There may be children having normal intelligence, yet, lacking in the specific ability such as arithmetic, reading or composition. Backwardness may result in general backwardness. This may be removed through special training.

3. SOCIALLY HANDICAPPED

Some children are found to be suffering from difficult behaviour problems. In such cases first the causes of social maladjustment should be discovered and removed. Then they should receive training in special classes with special environment and special equipment.

4. PHYSICALLY HANDICAPPED

Children having speech-defects, being hard of hearing and those who are deaf, partially sighted blind, and dumb come under the heading 'physically handicapped'. Each of these categories should be treated separately. Each of them should have separate special classes with special apparatus and equipment under the guidance of an expert.

5. GIFTED CHILDREN

Very bright or gifted children having an I. Q. on the range from 125 to 140 also create special problems of educational adjustment. They should have a richer curriculum than that of the regular grades. They should be provided with opportunities for initiative and original creativeness.

Children with high specific ability should be provided with special opportunities along the line of their specific talent.

6. NEUROTICS AND ABNORMALS

Neurotics and abnormals have been treated separately in separate chapters. Neuroses arise from several emotional conflicts not properly dealt with. A neurotic person is not insane. He is simply eccentric. He is normal in all respects except that he has certain fears, obsessions and anxieties.

7. EDUCATIONALLY HANDICAPPED

Educationally handicapped is a child who is not able to do the work of the class below that which is normal for his age. He is also called educationally backward. The cause of educational backwardness may be any or several of the above-mentioned handicaps. It may be due to low 'g' or lack of specific ability or social maladjustment or difficult behaviour or some physical mal-nutrition or bad home-conditions or temperamental mal-adjustment. Burt found that low 'g' was the cause of backwardness in 60% of the cases, temperamental defects in 9%, physical defects in 9%, psychological reasons in 7%, bad home conditions in 12% and bad school-conditions in 8%. Shonell's figures are in close agreement with those of Burt. He found about 8% of the backward children were intelligent enough to do average work but were simply lacking in persistence.

Burt uses the term merely backward for those retarded in educational attainments due to those causes which can be cured.

For adjustment of the educationally retarded children improvement in the home-conditions and school-conditions is also necessary.

Sometimes educational backwardness may be due to the complexity of causes. Burt and Shonell discovered some cases in which there were several adverse factors of backwardness. They found that in 10% of the cases of a study the main reason of backwardness was long absence from the school and behind this there were several factors such as bad home-conditions, physical disabilities or lack of specific ability.

If we use educational ratio A.Q. the backward child is one whose A.Q. is very low—according to Burt, say below 85.

THE DIFFICULT CHILD

There are some children who present difficult behaviour problems. They are not well-adjusted to their environment and create problems for their parents and teachers. Due to the maladjustments as such, they are not benefitted by their education. Following are some examples of such difficult children:

A. THE TRUANTS

Some children are habitual victims of truancy. They are vagabonds and habitually run away from the home and the school. They own an aimless life. They are generally considered a great nuisance in the home as well as in the society. Treatment of this lies in rehabilitating the child mentally as well as emotionally. The truancy may be due to loss of love and fellowship, lack of interest in school work, fear of the parent or the teacher, lack of purpose or motive in life, any of the physical deficiency or some mental abnormality. When the cause is discovered efforts should be made to remove the same through proper treatment and education.

B. OBSTINACY AND NEGATIVISM

Some children are very obstinate and negative. They do contrary to what is told them. They wilfully disobey their parents and teachers. They care for none and pay no regard to their elders. There may be various causes of this. This may be due to perverted self-assertion or due to wrongly directed tendency of self-expression. At the back of this there may be inferiority complex, some other conflict, jealousy, favouritism. In this case also first the right cause should be discovered and then reduction should be attempted accordingly.

C. Habitual Stealing, Telling a Lie etc.

Adler traces the cause of these difficulties to the early inferiority complex of the child. He does so because of strengthening his self which he considers to be weak and inferior. However, there may be different cause in different children which have to be located and removed through proper guidance, love and affection.

D. Inattention

Some children are habitually inattentive in the class. For this also there may be responsible a number of psychological and physiological factors such as lack of interest, introvert nature, deficiency in learning and understanding, weak constitution or some disease. The cause has to be found and removed.

ABNORMAL CHILDREN AND THEIR TREATMENT

Meaning and Nature

There are three most common bases for judging normality—subjective, statistical and materialistic.

Subjectively, normality is determined by the personal opinion of the individual and the subjective attitude of the society or group in which the child lives. According to this those who are liked by their associates and whose conduct fits in within that of the group are considered normal. Those who are not liked and whose behaviour is out of harmony with the group standard are considered abnormal.

According to statistical method the majority of the individuals possess an average amount of traits. On both the sides of this majority, are a few who possess a very small amount and a few who possess a very great amount. On a graphical curve the normal will be in the middle and the abnormal at either extreme. For example, normal intelligence quotient is considered to be 100. A deviation of 30 points below 100 is suggestive of feeble-mindedness. A corresponding deviation on the other direction represents a case of genius or near genius. Deviation on the minus side is an abnormality. A normal person is an average person.

From the materialistic point of view abnormality is also judged on the basis of the presence of the agents which produce abnormalities. In the normal these agents and characteristics are not found to be present. But in the abnormal they are present in small or large quantity. Many aspects of mental disorders are characteristics of the abnormal. Thus presence of the causal agent, such as some degree of paresis, drug-addiction, brain tumour etc, is also an indication of abnormality. In the abnormal these agents are not found.

CAUSES OF ABNORMALITIES

Following are the main causes of abnormalities:

1. Improper Training

Certain undesirable habits are formed by the pupils as a result of improper training. Speech disorders, use of poor English, tendency to bullying and teasing, temper-tantrum etc. are the product of improper training. But these should not be considered as abnormalities. They are only bad habits.

2. Physical Causes

Truly abnormal personalities are found only in abnormal bodies. Personality has its basis in the proper functioning of the body machine. When the mental disease has physical basis it is called organic. Other types of mental diseases are functional. Functional diseases, too, may have ogranic basis. Following are a few examples of the abnormalities that result from bodily defects.

Various abnormalities are caused by the disorders of glands.

GLANDULAR DISORDERS

(i) Under-active glands have been found to be the cause of cretinism in children. Sometimes throat infection damages the thyroid gland resulting in the lack of thyroid secretion. This causes cretinism in children. Due to this lack of thyroid-secretion the child remains dwarf physically and an idiot or imbecile mentally. He has no ambition and no emotional life. He is indifferent to the joys of success and sorrows of the world. He can be cured by administering thyroid extract.

(ii) Over-active thyroid too results in various abnormalities. When the thyroid is over-active it secretes two or three times as much as is required. This causes abnormalities. The individual becomes restless and irritable. He can not sleep at night and he loses weight. He goes into an emotional outburst on the slightest provocation. If this secretion is reduced by operation he returns to his normal behaviour.

In the same way abnormalities are produced by the disorders of the function of other glands. An account of this is given in previous pages.

INFECTIOUS DISEASES

Paresis is caused by syphilitic infection of the brain. When this disease appears the individual becomes lazy, dull and desolate. Judgement wanes and absurd delusions and hallucinations constitute the mental life. "Marked egotism and grandiose ideas develop. The patient becomes boastful."

In the same way "focal infections", "encephalitis" and anaemia cause various personality-abnormalities.

KINDS OF MENTAL DISORDERS

In 1933 the American Psychiatric Association adopted a classification that includes 22 major groups of mental disorders and 36 minor ones. John J.B. Morgan simplified the list and gave the following classification:

1. *Feeble Mindedness*

Or mental deficiency.

2. *Neurosyphilis*

Caused by syphilitic infections of the brain and nervous system, Paresis is the most common of this type of diseases. In this disease "the patient becomes lazy, dull and desolate. Judgement wanes and absurd delusions and hallucinations constitute the mental life. Marked egotism and grandiose ideas develop. The patient becomes boastful."

3. *Traumatic Psychoses*

These are caused by physical injuries to the central nervous system.

4. *Senile Dementia*

Or old age neural deterioration.

5. *Somato-Psychoses*

These are mental disorders caused by other infections such as "focal infections" and "encephalitis" or by anaemia or by glandular abnormalities. Underactive thyroid causes cretinism in children. Some times throat infection damages the thyroid which results in the lack of thyroid secretion. This in turn affects the growth of the child. He remains dwarf physically and an imbecile mentally. He has no ambition and no emotional life.

Over-active thyroid gland on the other hand makes the individual restless and irritable.

In the same way abnormalities are cused by the disorders of other glands.

6. *Toxic Psychoses*

These refer to the disorders caused by drugs and poison,

7. *Epilepsy*

It is the loss of memory which involves convulsive seizures.

8. *Schizophrenia*

Or dementia precox is a "mental disease characterized by an extreme disorganization of the emotional life, hallucinations, fantastic delusions, persoanlity-disintegration with relative intellectual preservations."

9. *Manic-Depressive Psychoses*

These involve extreme depression or alternation between the two.

10. *Paranoia*

This involves persistent delusions usually of persecution or grandeur.

11. *Psychoneuroses*

These are mental disorders which have no organic basis. They are milder forms of psychoses.

12. *Psychopathic Personality*

This refers to persons who have no mental disorders but can not adjust themselves socially and legally.

PREVENTION AND TREATMENT OF MENTAL DISEASES

The first concern of the teacher is the prevention of the disorders.

Prevention of mental diseases and disorders is "complicated medical, social and psychological problem". Some of the diseases can be prevented while others can not. If persons are kept away from drugs, alcohol and syphilitic infections they can not develop paresis.

The most practical plan is to keep the children away from the stress and strain of frustrating situations.

The teacher should also pay attention to the fact that the growth of children is progressing normally and that no child suffers from any physical abnormality.

As regards treatment if such patients are discovered the teacher should not interfere unduly, unless he is a specialist. He should refer the case to the psychiatrist or the specialist doctor as the case may be. He should send the case to the mental hospital. Fundamental duty of the teacher is to detect the case and then submit to the specialist.

A few mental diseases are incurable. Damaged structures underlying senile psychoses can not be repaired. Long-standing diseases too are generally incurable. Middle-aged or elderly patients too can not be helped.

Often medical and psychological treatment aids a patient. Alcoholic psychoses for example can be cured when the patient quits drinking, learns to rest and relax and gradually builds up physically. In the same way an epileptic may be treated with drug or dietary treatment.

QUESTIONS

1. What do you understand by deficiencies and abnormalities ? What will you do as a teacher in order to remove them?
2. What are various types of deviating children? What will you do for their better adjustment and educational guidance?
3. What are various causes of mental abnormalities? How can they be removed?
4. What do you mean by the "difficult child"? How can you help such children?

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CHAPTER XXIII

THE PSYCHOLOGY OF THE GROUP

MEANING

Until now, attention was focussed on how human beings behave as individuals. Another aspect of their behaviour is when they act as members of some group. We are affected tremendously by the persons we see and talk to daily. Marked changes in the behaviour of the individual result when he is in the midst of some group of persons. F. Dashiell found in an experiment that "persons tend to work faster but less accurately when spectators are present". "Having co-workers generally steps up performance", says F.H. Allport. Some writers have said that "people in crowds frequently fall below their normally accepted standards of thought and conduct." In the words of LeBon "the voice of the masses becomes preponderant." "When human beings have been transformed into a group it puts them in possession of a sort of collective mind which makes them feel, think and act in a manner quite different from that in which each of them would feel, think and act were he in a state of isolation." In the group the individuals think, act and feel together. But the thinking feeling and acting of the group as a whole are different from the normal thinking, feeling and acting of the individuals who compose it. The group-modes of thinking, feeling and acting are inferior to those of individual modes. But they may be superior too. For example in a crowd "individuality is damped down", while in the higher forms of social groups it may be lifted high up. The fact is that "where two or three are gathered together new forces are at work, welding the individuals into a new organism." These forces are the instincts of self-assertion, self-abasement and mimesis (suggestion, sympathy and imitation—See pages 73 to 82). Mimesis is imitation—imitation of thoughts, feelings and actions. These three shape the collective consciousness. The effectiveness of these three forces results in the less desirable aspects of collective behaviour.

TYPES OF GROUPS

We can trace various types of groups in which human beings are found to be moving. Each one of them has different characteristics. They have been classified in different ways, but we are more concerned with the classification of Drever who gives the following types:

1. The Crowd type.
2. The Club type.
3. The Community type.

The crowd has a very short life. It has no permanent existence and so no permanent affiliation of the individuals. Its modes of feeling, thinking and acting are temporary. It has a momentary consciousness and has no memories or sentiments as a "group". It "merely follows the impulse of the movement." In the words of McDougall a crowd is "excessively emotional, impulsive, fickle, inconsistent, irresolute and extreme in action displaying only the coarser emotions and the less refined sentiments." Thus three factors characterise the behaviour of a crowd—(a) collective inhibition of intellectual process, (b) heightening or intensification of emotion, and (c) regression to the instinctive level of activity.

The club-type is held together not merely by "the temporary excitation of an instinct, but by the possession of some common interest, sentiment or ideal powerful enough to weld its members into a collective organism". It is relatively permanent. It has two main characteristics—restraint and thoughtfulness. In the club-type it is the thought and not the feeling or the impluse that dominates.

The community-type has a comprehensive common purpose. It has continuity and permanence. The community differs from the club in the "width of its purpose". "It focuses the whole life of its members, enabling the individuals to achieve complete self-realization."

THE GROUP-MIND

Just as it is assumed that behind the individual behaviour there lies an individual mind, in the same way they assume a collective mind behind the collective behaviour. If the mind is "an organized system of mental or purposive forces" in the words of McDougall or if it is an "organized and relatively permanent system of physical forces and factors, manifesting itself in such phenomena as memories, ideas, sentiments", in the words of Drever, we may correctly talk of the group—mind in case of the club-type and the community-type. But the crowd has no such mind. It has no memories or the sentiments. Other organized groups do have a mind in the sense that the behaviour of the group is determined not by the individual consciousness but by the collective consciousness. The individual is influenced by his group mileu. In highly organized groups the morals are higher than those of the individuals. High degree of unselfishness and devotion, reason and sound judgement become possible in virtue of the collective consciousness or the group mind. Thus, the group mind is a very effective force in determining the behaviour of the individuals who compose the group. It is also desirable, therefore, that groups should be organized on a higher level, having a higher purpose and lofty aim for the welfare of the society. Following factors are important for the unity and organization of the groups :

BASIC FACTORS OF THE GROUP-LIFE

Following factors are essential for organized group life:

1. Common interests, similar attitudes and sentiments.
2. Group consciousness which consists in thinking of oneself as a member of a particular group.
3. Group loyalty, "an emotional bond that keeps the individuals together." It is a sentiment involving a "sense of obligation to the group, a readiness to sacrifice for the group."
4. Physical proximity i.e., living together or near one another.
5. The leader who inspires, leads and brings the individuals together.

6. A degree of continuity of existence of the group.
7. Group consciousness i.e., members should have an idea of the nature, composition, functions and utility of the the group.
8. Certain traditions and customs which determine the relations of the members to one another.
9. The group-spirit which, in the words of McDougall, "serves as a bond and that holds the group together. It raises men above the purely animal level of conduct. It extends each man's interest beyond the narrow circle of his own home and family."
10. The group morale i.e., the soundness of a group or the devotion and the loyalty of the members. It is the tone and the tempo of the group life. It originates in the traditions of the group. It is the very heart of the group-life. It is based upon: (1) a belief in the superiority and worthwhileness of the structure of the group, (2) identification of personal goals with group-goals, (3) favourable judgements of the abilities of the group-leaders, (4) a belief that the group resources are sufficient to protect the individuals, and (5) confidence in the permanence of the group-goals. Inefficiency of the group, selfishness of the office-bearers, dishonesty and the insincerity of the leaders are the enemies of the group-morale.

SIGNIFICANCE IN EDUCATION

The most effective agency of education and place for learning and teaching are the schools. The school is a place where a number of individual students gather together for common purpose to achieve, where they happen to be to secure knowledge, information and skill—even more than this to receive social cutlture and achieve self-realisation. It is, in this sense a social group, an organized group. All those conditions and factors that operate in an organized group do operate in the schools. The school is an organized group. Therefore, the success of a school depends upon the working of the forces of the group psychology.

The school exists for certain definite ends in view as determined by the philosophy of education. If the schools have to suceeed in their mission and education has to be real to fulfil its aims, psychology of the group must be harnessed to the prupose. What the children will learn, whither will they go and what will they do when grown up depend upon the "mind" of the school. The desirability of cultivating a group-mind in the schools and institutions is, therefore, very great. It is this 'group-mind' of the school that will shape the charactet and personality of the individuals. It is this 'mind' that wir determine the type of sentiments, attitudes, interests and ideall and habits of the pupils. By this will be determined the modls of feeling, thinking, and acting of the individual studenes members of the school. The influence of the group upon tht- life of the individual is very great. Therefore, if the adminise trators, teachers and the national leaders are serious about th- uplift of the nation, built of citizens, the product of the schoolse they must organize the schools as groups on higher levels., Such schools will raise the nation up. For this purpose the following points are to be noted:

1. We should raise the school morale, tempo and the tone of the schools. The school should have high traditions. Virtues and ideals should be actually lived in its environment.

2. The teachers should play the role of true leaders. They should be sincere, honest and virtuous. They should be capable to lead the pupils.

3. There should be abundance of life, free mixing and free interaction amongst the pupils as well as between the students and the teachers to influence each other.

4. Love and affection should cement the ties and generate an emotion that will hold the pupils and the teachers together.

5. There should run along with the 'ethos' of the school a stream of great ideas. "Like an army banners flying is the strength of a great idea." By way of 'mimesis' these will become part of the pupils' life.

6.f The students should be enabled to develop a sentiment or he institution, a group-consciousness. This may be done though co-curricular activities—the games, functions, old-boys-clubs, competition and excursions.

In this way a group-life can be organized in the schools. If so organized they will turn out better citizens and public-spirited youths. In such schools the boys and girls will learn to live according to finer designs. Such will be the schools where the sun will shine brighter and where the boys and girls will come from corners where the sun shines dimly. Each evening they will carry the part of this light back into their places, slowly but surely transforming it.

QUESTIONS

1. The school is an organized group where the forces of Group Psychology operate and shape the individuals. Discuss.
2. What are various characteristics of a well-organized group? Mention how you will achieve that atmosphere in the school.
3. Distinguish between the crowd, the club and the community. How will you organise the school in a community?
4. Discuss the role of Imitation and Suggestion in the school environment.
5. What is a group-mind? How can you structurize a group-mind in the school? Of what value is it?
6. "The environment of the school is all that is important" discuss and state how you can improve the tone of the school.
7. Discuss the application of Group-Psychology in Education.

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CHAPTER XXIV

INTELLIGENCE AND ITS MEASUREMENT

NATURE OF INTELLIGENCE

Previously intelligence was regarded to be a faculty of the mind. But in the 18th and 19th century different theories were evolved to explain the nature of intelligence. Most important of them were Monarchic (unifocal), Oligarchic (multifocal) and Anarchic (nonfocal).

Monarchic doctrine believed in one great power of the mind dominating over others. Prof. Spearman defined this to be an "all pervading mental power" or to put it in the version of Ross "conscious adaptation to new situations" or "inborn all round mental efficiency".

Oligarchic or multifocal doctrine did not believe in this. This said that mental capacity consisted of not only one great power but of a few great powers. Binet, a French psychologist believed in three great powers of the mind. But this doctrine too, could not find support. Psychologists then went further and held that energies of the mind are dominated neither by one great power nor a few great powers; there is only anarchy in the kingdom of the mind and that the average of all these energies is intelligence. This theory also remained unsatisfactory because it was difficult to find out the average of energies. By the same time when theories were spinning in this way Prof. Spearman came with Two-Factor-Theory of Intelligence.

TWO-FACTOR-THEORY OF INTELLIGENCE (ECLECTIC THEORY)

According to this theory, intelligence is that ability of the mind which is a combination of two factors 'g' and 's'. The 'g' is the general factor and 's' is the specific factor. The 'g' remains the same in all the activities and never increases or decreases from activity to activity. It remains constant wherever the individual moves. Yet it varies from individual to individual as well as from activity to activity in the same individual, for example, in music 'g' and 's' both are combined together. Here 'g' is innate and fixed amount of mental energy, while 's' is that factor of mental energy which is specifically required by the activity of music. In the same way in the profession of Law legal activity implies the presence of two factors 'g' and 's'. Here 's' is the specific ability required by the legal activity. Thus factor 's' refers to specific ability required by the specific activity and 'g' is general ability which accordng to Burt is "innate, central, permanent and constant" and with which an individual is born in this world. The 'g' factor is gifted and cannot be increased even with one's all the best efforts. If this conception of intelligence is accepted the success of a person's achievement in a particular activity depends upon the play of these two factors 'g' and 's'. This may be represented by the following equation:

$$A = \text{'g} + \text{'s'} \quad (A = \text{achievement})$$

Thus following are the characteristics of the factors 'g' and 's':

CHARACTERISTICS OF THE 'g' FACTOR

1. It is gifted and constant.
2. It runs through all activities in whatsoever quantity It be.
3. It varies from one individual to another.
4. Presence of a high 'g' guarantees a good quality and quantity of success.

CHARACTERISTICS OF THE 's' FACTOR

1. It varies from individual to individual.
2. It varies from activity to activity.
3. Presence of high 's' guarantees a high success in that very activity; but without a high 'g' it cannot succeed to that very level.

Prof. Spearman calls this "Eclectic Theory" because it includes the truth of all the three theories already described. If we regard the 'g' factor as one big factor or the sole factor, monarchic doctrine is satisfied. If we regard the 'g' factor not the sole one and take into consideration so many 's' factors, oligarchic doctrine is satisfied. If every 's' is broken into a number of parts (constituents) there will be anarchy in the kingdom of the mind.

Though, surprising variety of opinion is found regarding the nature of intelligence, it is quite possible to group the various opinions under three heads—those who think of intelligence as "a single ability common to all intellectual processes"; those who regard it as "a group of two or three abilities of varying degree of generality" and those who regard it "as representing all specific abilities". Stern, Woodrow and Spearman hold the first theory. Stern defines intelligence as "general adaptability to the problems and conditions of life." Woodrow calls it "a capacity to acquire capacity". Spearman regards it as "general ability" . Binet, Terman and Maxwell Garnett hold the second theory, the group theory. Binet regards intelligence as involving at least three factors. Terman summarises these factors as "1. tendency to take and maintain a definite direction, 2. the capacity to make adaptations for the purpose of attaining a desired end, and 3. the power of auto-criticism." Maxwell Garnett holds that the general factor 'g' is compounded with one or perhaps more than one group factors to constitute intelligence. The third theory of the independence of the several traits is advocated by Thorndike, though not with full confidence. G.H. Thomson's Sampling Theory of Ability also comes under the same head. He assumes that "each man's mind is a sample group of qualities."

Dr. Johnson holds that "every individual has certain abilities and the most important of these goes by the name of intelligence." He defines it as "the ability to solve the general run of human problems, to adjust to new situations and in short the ability to think."

According to Prof. Woodworth intelligence is a characteristic of behaviour. Terman holds it to be "an ability to think in abstract terms."

Behaviourists give a mechanistic definition and say "Intelligence is a physiological mechanism integrating stimuli and producing adequate and uniform response."

Munn identifies it with "flexibility of the mind to meet new situations." To Woodworth "Intelligence is innate capacity to solve the problems easily in the light of the past experience and knowledge". In short it is an ability to perceive the right thing at the right moment in the right way. In the words of Wyatt it is an ability of the mind to "apprehend relevent relations." It is the discovery of relation and eduction of correlates.

Factor 'g'

The question arises what is the nature of the factor 'g'. Really speaking 'g' does not represent intelligence in the same sense in which an ordinary man understands it. Prof. Spearman did not identify 'g' with intelligence. To him it is highly technical and simply a mathematical quantity which plays a very high role in all mental operations. Spearman tends to view it as mental energy, "an ultimate hypothesis". In his own words 'g' is "some force capable of being transferred from one mental operation to another different one," that is "mental energy derived from the whole cortex...........switched off from one operation to another."

Thus 'g' seems to be a perceiving capacity of the mind. It may be understood as mind's capacity for analysis and synthesis i.e. the capacity to observe certain things or situations when certain relations are involved. The individual who possesses this capacity is a person more intelligent than others who do not have the same to that extent.

Spearman announced his two-factor-theory in 1904. Later he modified it and added to it certain group-factors, less general, widely spread and homogenous than 'g' and 's', e.g. intelligence in composition, according to this modified version was consisted of 'g'+'v' (consisting of several sub-factors such as capacity of writing, thinking, imagination, expression.)

Several criticisms were levelled against Spearman's theory. They said, it is too mathematical. Hamilton once remarked, "thinking over intelligence much in terms of factors we shall get further and further away from the psychological realities."

Physiological Account

Thorndike in the United States opposed these 'g', 's' and group-factors. He said this is over-simplification of intelligence. In Britan Speraman's most active critic has been Thomson. Prof. Keley also criticised it and proved with his improved techniques that 'g' itself is a combination of group factors which his method can thrash out. To him mental life operates "in a network of canals." Thorndike said that intellectual tasks are carried out by a complex nervous system operating in many difficult patterns, patterns too difficult to be described fully. He regards mind as a multitude of functions. He asserts the independence of the several traits that go to make up the mind. He defines intelligence in terms of physiology as a "capacity for mere association or connection forming".

But this theory too has been criticised because it is not in consonance with the findings of general psychology or the new analytical school.

Factorial Analysis

Thurstone found out eight primary mental abilities which made intelligence. This analysis is different from that of Spearman and Holzinger in giving less weight to the general ability. He resolves the performance wholly into "primary abilities", the equivalent of group factors and then takes the general factor as whatever the primary abilities have in common. He gives the following abilities:

1. Perceptual ability (P)
2. Numerical ability (N)
3. Verbal 'V'
4. Memory 'M'
5. Reasoning Ability—Deductive and Inductive thinking 'D' & 'I'
6. Spatial Ability. 'S'
7. Fluency in dealing with words. 'W'

Thus, researches which began with Spearman and were refined by Thurstone and Terman with Binet demonstrate that abilities in general may be conceived as:

1. a general ability entering into almost all performances but far more into complex relation to education than other performances.

2. certain group-factors each covering an area such as verbal, numerical, spatial, musical etc.

3. and certain abilities which are absolutely specific to one performance.

MEASURING INTELLIGENCE

By the close of the 18th century Gall discovered a science of the study of the head to measure one's mind. This science was known as phrenology.

Lavater published an essay on physiognomy and said that face was the index of mind. Graphology discovered that mind is revealed by hand-writing. But these methods are untrustworthy.

At the end of the 19th century Lombroso said that the abnormalities in the shape and size of the skull, forehead and nose etc. could give an idea of one's intelligence.

In 1906 Karl Pearson by the method of correlation disproved that intelligence could be guessed from face or the head.

SCIENTIFIC TESTING

The crucial point from which a definite scientific wave of measuring intelligence emerges on is 1879, when Prof. Wundt established a laboratory at Leipzig in Germany.

About the same time in England Galton began his discoveries. But he could not develop his intelligence test. In 1890 in America J.N. Cattell published a work on "Mental tests and Measurement" and described single tests of separate factors or abilities such as sensation, reaction time, speed of movement and so forth. But the real work appeared in the hands of Binet of France. In 1905 he published a test, but he was not satisfied with this. So he began to rework and in 1908 a revised version of the 1905-test was published which was meant for the pupils from the age of 3 to 11 years.

With this test, Binet introduced the concept of mental age. He revised problems and exercises to test comprehension, memory, power of comparison, ability to draw conclusions, reasoning and other mental powers.

But again with the help of Prof. Simon another version of the same test was published in 1911 called as Binet-Simon-Test. This last revision included more tests and it could test pupils from age 3 to the age of adulthood.

This Binet-Simon test was introduced in America by Goddard. In America this test was modified and revised again by Terman and Merrill in 1916. This revision is known as Stanford Revision of Binet-Simon-Test.

Terman chose six tests for each year from 3 to 10 inclusively and also for ages 12, 14, 16 and 18. He assigned 2 month's mental-age-credit for each test passed. Many of Binet's items were included, though some were shifted to higher or lower age-levels, and several new test-items were added. It had in total including alternate items 90 tests instead of 54 of Binet's scale of 1911. Binet had introduced an idea of mental age. A German Psychologist Wilhelm Stern suggested in 1912 to replace mental age by "I. Q." found out by dividing the mental age by chronological age and multiplying by 100.

The revision of Binet-Simon scale of 1916 was again modified in 1937 by Terman and Merrill. It was a considerable improvement upon that of 1916. The 1937's revision had two forms L & M, while 1916's test had only one so that when a person was retested he could be tested with a different form thus avoiding its practice-effects. It was lengthened to extend from the year second up through the superior adult e.g., the maximum mental age that could be tested was 22 years. Meanwhile revisions of the form L for British children had been prepared by Burt and by Kennedy Fraser.

Thus, following revisions of Binet-Simon scale were made:

1. Stanford-Binet-Simon-Test by Terman And Merrill in 1916 and then in 1937.
2. London Revision by Prof. Burt.

CHARACTERISTICS OF THE BINET-SIMON TEST OF 1911

1. It consisted of 54 tests.
2. It extended from 3 to 16 years excluding 11, 13,, 14.
3. It had 5 tests for each age but 4 for four years old children.
4. It included questions on sex, name, number and picture etc.

CHARACTERISTICS OF BURT'S REVISION

1. It had 65 tests instead of 54.
2. It covered a period from 3 to 16 year.
3. Number of tests was not the same for each age.
4. Nature of the test was almost the same e.g., it had questions such as :

For the 8 years Old Children

1. What will you do if you miss the train?

For the 11 Years Old

2. Why should you judge a person by what he does and not by what he says?

For the 15 Years

Questions based on differentiation between abstract terms such as happiness and pleasure are put.

CHARACTERISTICS OF STANFORD-BINET-SIMON-TEST OF 1937.

1. Nature of tests varies from the lowest age level to the superior adult. At the lowest age-level the verbal nature of the test is minimised by using concrete objects.
2. It covers the age from 2 to 22.
3. At the lowest level the child is asked to identify a toy, a cup, a spoon, chair, fork etc.
4. At the upper age levels the intelligence is measured by verbal and abstract terms.

5. There are pictures in which missing parts are to be filled in according to a definite pattern.
6. Tests of word-meaning appear at a number of age levels.
7. Memory is tested by reading a section of a story and writing how much the subject can recall. Both auditory and visual memory are tested.
8. It has two forms L and M.
9. It gives us I.Q., not mental age.

This is in brief the history of intelligence tests.

The I.Q.

The I.Q. is calculated thus—If the child to be tested is 6 years old, start giving tests of 5 year-level and go up until he fails completely and is not able to solve even a single item of the test. Similarly come down below 5 years till he passes all the tests of a year.

Suppose it is required to find out the I.Q. of the child who passes all the tests of the year III, 4 of the year III-6, 3 of IV, 2 of IV-6, I of V and none of VI, it will be done like this:

The year III is the basal age because the child passes all the tests of that level. The mental age given to each test passed in the Stanford-Binet-Test of 1937 is as below:

Year	No. of tests for each L & M Form	Mental age for each test passed in months
II	6	1
II-6	6	1
III	6	1
III-6	6	1
IV	6	1
IV-6	6	1
V	6	1
VI	6	2
VII	6	2
VIII	6	2

Year	No. of test for each L & M Form	Mental age for each test passed in months
IX	6	2
X	6	2
XI	6	2
XII	6	2
XIII	6	2
XIV	6	2
Average adult	8	2
Superior adult I	6	4
Superior adult II	6	5
Superior adult III	6	6

Now, the above problem will be solved with the help of the above like this:

Year	No. of tests passed	Mental age for each test in months	Total M.A. gained in months
III-6	4	1	4
IV	3	1	3
IV-6	2	1	2
V	1	1	1
VI	0	0	0
		Total	10

Basal age=3 years or 36 months as the child passes all the tests of the 3-year-age-level.

Above this he gains 10 months mental age more.

Therefore, his total mental age is 36+10=46 months.

Therefore $\text{I.Q.} = \frac{46 \times 100}{36 \text{ (chronological age)}} = 127.7$

For calculating I.Q. chronological age is counted upto 16 years only. Upto 13 years actual age is counted. Between 13 and upto 16 years only $\frac{2}{3}$ of the additional year or years is added to 13. That makes subjects, real chronological age for purposes of callculating I.Q. For 14 years 13-8 months, for 15 years 41 4 month and for 16 years only 15 years chronological age is counted. Beyond 16 years we do not count actual years and months, but irrespective of actual age it is counted in all cases only as 15 years.

CLASSIFICATION OF TESTS

Intelligence tests are of two kinds—Verbal and Non-Verbal or Linguistic and Non-Linguistic. The verbal tests require an use of language. In the non-verbal tests language is not used. The subject is required to do something. He does not use language. Non-verbal tests thus require only the manipulation of muscles.

Non-Verbal Tests, too, are of two types :

(a) Paper and Pencil Tests and (b) Performance Tests.

Paper and Pencil tests are also of two types :

(a) pictorial, and (b) perceptual.

Binet test required normal functioning of vision, hearing and language-ability. It could not be applied to the blind, the deaf or the illiterate. So Performance tests were devised to meet these special conditions.

About 1850 a French physician Seguin constructed a test for the feeble-minded children. Later Dr. Healy made a completion test. Then Pintner and Paterson two psychologists of the University of Ohio State combining together the Seguin, Healy and other similar tests prepared the first Performance scale in 1917. In this scale all the tests call for a motor response.

Some of the most famous performance tests are:

1. Pass Along Test.
2. Knox's Wooden Cube Test.
3. Pintner Paterson Test.
4. Portius Maze Test.
5. Kelley's Test of Building the Best Thing.
6. Gooddard Form Board Tests.

From another point of view tests are of two types—Individual and Group Tests.

In the Individual Tests subjects are tested individually one by one.

Group Test is a test that can be administered to a group of people at the same time. The stimulus came from World War

First 1914. The problem was to test the intelligence of a number of people to be employed for various war-services. The result was that Army Alpha for literate and Army Beta for illiterates, two tests came into existence. When the war was over more accurate group tests were constructed.

Construction of Verbal Group-Tests

Following eight types of problems saturated with intelligence are contained by these tests:

1. Number series e.g. 3, 6,12, 24.........192.
   The subject is asked to complete this.
2. Alternatives or Multiple Choice Tests—e.g. The mango is to a fruit as potato is to.........
3. To designate superfluous part or Classification Tests. The subject has to underline the odd word. Mango, table, chair, tool, bench.
4. To arrange in order the mixed sentences.
5. Matching Tests: The subject has to select two objects matching one another as "the grass is green as the sky is cloudy, far-away, rough, blue".
6. Analogies e.g., Sun is to dry as rain is to cloud, shower, wet, pool.
7. Sentence Completion: The subject has to complete the sentence e.g., Man is perhaps the only animal that has the ....to reason.
8. Synonyms and antonyms-type tests.

Advantage of Group Tests

1. They save time, testing hundreds and thousands of the subjects together.
2. No expert is needed in administering them.

Disadvantages

1. They are not as accurate as Individual tests. Validity and reliability of group tests are less than those of the Individual tests.

2. Language difficulties may influence the achievement of the candidates.

DISTRIBUTION AND SIGNIFICANCE OF I.Q.

Following is the significance and distribution of I.Q.s:

Below 20—25 Fools.
25—50 Imbecile.
50—70 Moron (including 60-70 feeble minded).
70—80 Mentally deficient.
80—90 Dull.
90—110 Average.
110—120 Superior.
120—140 Very Superior.
Above 140 Genius or near genius.

ADVANTAGES OF INTELLIGENCE TESTS

Intelligence tests are very useful

1. For educational guidance and for providing checks at different stages of the courses of study.
2. To detect the superior and the dull, and adjust teaching accordingly. This implies that method of teaching must be different for children of different ability.
3. They can be used to supplement traditional examination.
4. In awarding scholarship etc., we may have intelligence test examination.
5. They can be used in vocational guidance.
6. They may also be used in the recruitment of various services.

CRITERIA OF A GOOD TEST

Following are the criteria of a good intelligence test:

1. Objectivity:—It must be objective. It should eliminate the effect of the whims and pre-occupations of the examiner on the scores.

2. A high degree of validity : It should be able to test the same thing which is desirable.

3. Reliability : It is the degree of correctness to which it measures the thing required to be tested. A good test must have a high degree of reliability.

4. Accuracy in administration : It must be accurate and simple in administering.

5. Scoring should be simple and rapidly possible.

6. Economical : It should not be expensive.

ADMINISTERING THE TESTS

1. A good acquaintance with the process should be acquired.
2. Prescribed conditions should be secured and maintained.
3. Temperament of the subject should be noted.
4. Temptation for copying should be minimised.
5. Proper arrangement for calculation should be made.

CONSTANCY OF I.Q.

Is intelligence hereditary or environmental ? Can it be raised by education? Problems like these demand to trace the influence of the heredity and the environment upon intelligence. This enquiry has already been treated in pages 38 to 44.

TESTS OTHER THAN INTELLIGENCE TESTS

Besides intelligence tests there are tests and devices to measure so many other capacities and achievements of the individual.

Type of Tests

Following are the kinds of other tests:

1. Achievement Tests or Attainment Tests or Accomplishment Tests.

2. Aptitude Tests or Speial Abilities Tests or Prognostic Tests.

3. Personality Tests and Character Tests.

ACHIEVEMENT TESTS

(a) Purpose

They have two purposes:

1. To measure present status of skill or progress in some object.

2. To measure not the innate abilities but the result of education in any particular field, e.g. drawing, dictation, history and geography.

(b) Types

They have following types :

1. Speed Type.
2. Power Type.
3. Scale Type.
4. Diagnostic Type.

Speed Test

A speed test measures the amount of work of a uniform quality done within a given time or the rate at which a certain work is done. Such tests are mainly used in Arithmetic, typewriting, shorthand, reading and writing. They are used only in cases where speed is an important factor.

Power Tests

They are tests which measure the difficulty that one can face and solve. They test one's power of doing difficult things. In Arithmetic questions are arranged according to difficulty and it is sometimes discovered as how difficult questions one student can do.

Scale or Quality Tests

They measure one's quality of work i.e., how well he has done some work regardless of time or difficulty. Such tests are used in drawing, handwriting, singing, composition and Geometry.

Diagnostic Tests

They are used to know the specific difficulties or weaknesses of students in different subjects.

Besides, there are accuracy tests also which test accuracy of one's performance e.g. in reading, writing, spelling etc.

Thus, the type of a test depends upon its function and objective. There may be according to variety of aims a variety of tests.

(c) CHARACTERISTICS

1. They are more objective and accurate.
2. They may be used for diagnositc purposes.
3. They to a certain extent, can replace the traditional essay-type examination. They are said to be better substitute of the highly subjective present-day examination system.

APTITUDE TEST

A. PURPOSE

1. To predict the future accomplishment in some field or subject.
2. To predict whether one is fit for a particular branch or not.
3. They differ from intelligence tests because they test, not the general innate 'g' factor but, the special abilities 's'.

B. TYPES

They are of following types.

1. Scholastic: These predict the future accomplishment in school subjects like Science, Medicine, Law etc.. For example, Iowa Placement Tests of Chemistry, Physics, English, Mathematics., Language etc., and the Stanford Scientific Aptitude Tests are scholastic.
2. Vocational: They predict the future achievements in different vocations. Strong's Vocational Blanks, Lehman Vocational Aptitude Quiz are very popular in this field.
3. Artistic Aptitude Test: Most popular of these are:
   a. Seashore Music Test for music.
   b. Stenquist Mechanical Aptitude Test.

C. ADVANTAGES

1. They are of great use for educational guidance, and
2. For vocational guidance purposes.

D. CONSTITUENTS OF APTITUDE TESTS

Following are the constituents of the aptitude tests. An Aptitude test is a test of several or all of the following factors:

1. Intelligence. 2. Interests. 3. Character. 4. Physical health, 5. Personality and Temperament.

For the sake of convenience in measuring, personality has been split up into certain factors. The analytical studies and researches have discovered twelve primary factors of character and personality. They are:

1. Cyclothyme v. Schizothyme Temperament. (+A *v.* —A).
2. General Intelligence v. Mental Defects (+B *v.*—B).
3. Emotionally Stable Character v. Demoralised General Emotionality (+C *v.*—C).
4. Hypersensitive, Infantile, Sthenic Emotionality v. Phlegmatic Frustration (+D *v.*—D).
5. Dominance v. Submissiveness (+E *v.*—E).
6. Surgency v. Melancholic, Anxious, Desurgency, Tolerance (+F *v.*—F).
7. Positive Character Integration v. Immature, Dependent Character (+G *v.*—G).
8. Charitable, Adventurous, Rhathymia v. Obstructive, Withdrawn schizothyme temperament (+H *v.*—H).
9. Sensitive, Imaginative, Anxious Emotionality v. Rigid, Tough Poise. (+I *v.*—I).
10. Neurasthenia v. Vigorous, 'obsessional-determined' Character (+J *v.*—J).
11. Trained, Socialized, Cultured Mind v. Boorishness (+K *v.*—K).
12. Surgent, Cyclothymia v. Paranoia (+L *o.*—L).

Each of these types has been analysed into various sub-factors and tests have been devised for each.

Factors A, D, F, H and L are more likely to have a constitutional role such as temperament and disposition factors, while C, G, I, J and K are considered as factors more dependent on environment and training and are more definitely connected with character-stability, personality-integration and moral control.

QUESTIONS

1. How Intelligence has been defined in the history of psychology? Discuss Spearman's Two-factor Theory.
2. What are 'g' and 's' factors of Intelligence and what are their chief characteristics?
3. What are various factors of Intelligence as given by Thurstone? What is the latest-position with regard to the nature of intelligence?
4. Give a brief historical account of the efforts made to measure intelligence. Discuss the characteristics of Binet-Simon Test.
5. Give some of the characteristics of Stanford-Binet-Simon-Test of 1937 and calculate the I.Q. of a 6 year old child who passes all the tests of year V, 4 of VI, 3 of VII, 3 of VIII and 2 of IX and none of X.
6. Give the classification of objective tests from different points of view. Name some of the important Performance Tests.
7. Discuss advantages and disadvantages of group tests of intelligence.
8. Discuss the range of individual differences in the general ability of the mind and mention how you measure these differences.
9. Of what use are the intelligence tests? If you have to use an Intelligence Test, what qualities you will like to see in the selected test for your purpose?
10. Is I.Q. Constant? Give experimental data that favours or disfavours the argument.
11. What are Aptitude Tests? Name some of the important Aptitude tests?
12. Discuss purpose, types, and characteristics of the Achievement tests.
13. How will you distinguish verbal and non-verbal tests? What are their respective advantages and disadvantages?

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CHAPTER XXV

CONSTRUCTION OF ACHIEVEMENT TESTS

Education or teaching is an activity and its effect is learning or modification of mental or conative behavior. This effect in education has to be evaluated or measured i.e. it is to be discovered as what and how much the child has learnt out of one subject or one situation.

OLD CONCEPT OF EVALUATION

In the old system of education evaluation took the form of school examinations. They are better termed as essay-type of examinations. It was believed that intelligence and other esoteric qualities of personality were expressed through writing answers in the form of essays. How much a student had achieved in a particular subject could also be gauged from these essays in that subject. Thus the score of these essay type examinations were considered good enough to measure the educational effect and also to forecast as how much one could achieve in future. Essay-type tests were the only instruments to know about the progress of students.

DEMERITS OF TRADITIONAL EXAMINATIONS

But soon it was discovered that these essay-type tests were not accurate tests of students ability. Numerous researches were carried on as a result of which following demerits were revealed:

1. *Unreliability*

An instrument is reliable if it measures exactly the same amount everytime. In order to be reliable its results must be the same on every occasion it is used or same when used by different persons in a single case. Our essay-type examinations do not give such results. It has been found that the same answer has been scored by different examiners differently. The range of marks varied sometimes from 30 to 80 in the same essay. Hence, this type of assessment is unreliable.

2. *Validity*

A test or an examination is valid when it measures the same trait, quality or function for which it is made. The traditional examinations were meant for measuring educational achievement in different school subjects. But, it has been found that they are not able to single out the knowledge achieved and are sometimes tests of mere rote memory which can not be the function of school examination. Hence, they are invalid.

There are other demerits also. They have become unwieldy and are difficult to be organised. They have distorting effect upon the curriculum. The questions set in the examinations are generally selective. The students prepare only important portions and leave others. Thus, the whole curriculum is distorted and its purpose is defeated. They are also highly subjective as the scores are influenced by the whims, opinions and interests of the examiners.

THE NEW CONCEPT

As a result of these demerits of the old examination system and emerging science of psychology, various attempts have been made to make the tests of achievements objective, reliable and valid. These attempts have resulted into construction of objective tests which are called Achievement Tests or Attainment Tests in various subjects. In foreign countries their use has become very popular and wide. In our country an attempt is being made to supplement the prevalent examinations with these Tests.

ATTAINMENT TESTS

Achievement tests measure one's acquisition of knowledge in a particuar subject. In a technical sense, they measure the functional effect and behavioral changes produced by a school subject within child's personality. Teaching of language has a definite function which is to produce such mental and behavioral changes as acquisition of vocabulary and its use (verbal behaviour), fluency in speech and expression (linguistic behaviour), improvement in writing (expressional behaviour), grasping and understanding, (receptive behaviour), refinement of feelings and emotions, (affective behaviour). Similarly, each subject has a functional effect which has to be located, defined and assessed.

Construction

In the construction of a psychological test four steps are involved. This is so with the Attainment test too. Following are the four steps:

1. Planning the test.
2. Preparing the test.
3. Trying out the test.
4. Evaluating the test.

PLANNING OF THE ATTAINMENT TEST

In planning of the attainment test one has to record the functional effect and the behavioural changes desired to be produced by a particular subject. It means that he has to thrash out various aims of teaching that subject. Then, an analysis of the courses prescribed in that subject is to be made. What is expected from the child with regard to these courses and aims is very carefully determined. For each class or grade a certain level of achievement or standard of knowledge and skill is expected. This has to be kept in mind. Planning must take into consideration the class for which the test is being constructed.

PREPARING THE TEST

After above exploration, the test is prepared. In drafting the test-questions one has to see that the courses of the subject for that class are well-represented. Memory items, grasping of the subject, interpretations etc. all should be tested by the questions. Care should be taken to test discrimination, judgement, intellectual and emotional attitudes, appreciations, application of knowledge. Questions should be appropriate to the material to be included. In the first draft these should be as many as double number of questions to be retained in the final test. Say, if in the final test you want to keep 100 questions, then have about 200 in the first draft. Questions should vary in difficulty from very easy to very difficult to suit all students' ability. As to difficulty, the test should be such as the average boy should be able to make about 50 of the possible scores. Easier items should be placed in the beginning and difficult ones in the end. The test is prepared in two forms—100 items in test A , 100 in Test B.

TRY OUT

This is the stage at which one tries to know as how good the test is. At this stage he has to make a selection of most suitable questions and reject others which are unsuitable. For this purpose the test is administered to about 200 or 300 boys representative of all grades of abilities. It is felt that there may be chances for the students to guess the answers of the questions. Hence to eliminate this effect a correction formula is applied. which is : $S=R-\frac{W}{N-1}$ in which 'S' means score corrected for guessing 'R' means number of right responses, 'W' is the number of wrong reponses. 'N' is the number of responses presented for each time.

EVALUATING THE TEST

The question at this stage is as which question should be retained in the test and which not. For this purpose we make an Item-Analysis of the test. We arrange all the scored papers in order of merits in descending order, the highest score being at the top. Then we distribute all the arranged papers into six equal files denoting them as s_1, s_2, s_3, s_4, s_5 and s_6. These can be distributed in 5 or 3 files too. These files represent different levels of ability. First file represents the highest ability, s_2 lower than that and s_6 the lowest level. After this make a table as follows :

Table No. I

No. of Testees*$_1$

Items	S_1 8	S_2 8	S_3 8	S_4 8	S_5 9	S_6 9	Total 50	I.D.	E13	Remark.
1	7	7	7	7	6	7	41	82%	.06	
2	8	8	8	7	6	8	45	calculate other values also like these		
3	8	8	7	6	7	6	42			
4	8	8	8	7	6	6	43			
5	8	8	7	6	6	7	42			
6	7	6	5	7	7	7	39			
7	8	7	7	7	6	6	41			
...	...	...	...	...	...	...	..			
...	...	...	...	...	...	...	..			
...	...	...	...	...	...	...	..			
...	...	...	...	...	...	...	..			
...	...	...	...	...	...	...	..			
...	...	...	...	...	...	...	..			
...	...	...	...	...	...	...	..			
50	...	...	...	...	...	...	..			

Now, take first file, and see how many students have correctly answered the first question in the whole file and put the number in the column s_1. Do the same for each group. Then take the second question (item) and see how many correctly answered it and put that number in each column. Complete the process till the last item is reached as is shown in the above table.

When through the above table it has been found out as how many students have correctly answered each question, now proceed to find out the "difficulty-value" of each question by the following formula:—

---

*$_1$ $\underset{8}{S_1}$, $\underset{8}{S_2}$.........$\underset{9}{S_6}$ represent number of testees in each file. i.e. 8 in S_1, 9 in S_2 etc.

Item Difficulty (I.D.) $= \frac{\text{Correct Answers}}{\text{Total No. of testees}} \times \frac{100}{1}$ e.g.
In the above table the first item is correctly answered by 41 out of 50. Hence I.D. $= \frac{41}{50} \times \frac{100}{1} = 82\%$. Enter this in the I.D. column. It means that the difficulty-value of question no. 1 is 82%. In the same way calculate this value for all items.

Now find out the Inter-Validity of the items by the following formula:

Internal validity, $E_{13} = \frac{(s_1+s_2)-(s_5+s_6)}{N/3}$ in which s_1, s_2 etc. mean correct answers of each file given in the above table. e.g. first item is correctly answered by 7 in s_1, 7 in s_2, 6 in s_5 and 7 in s_6. Total No. of testes is 50. Hence E_{13} of question No. 1 $= \frac{(7+7)-(6+7)}{50/3} = \frac{\frac{1}{50}}{3} = \frac{3}{50} = .06$. In the same way find out E13 of each question.

The questions for the final test are selected according to these values.

There are no hard and fast rules but the following order of difficulty might prove to be satisfactory :

About 20% of the itens of difficulty ranging from 0—40
,, 60% ,, ,, ,, ,, ,, 40—60
,, 20% ,, ,, ,, ,, ,, 60—90

Those items are selected whose difficulty-value is between 40%–60% and whose E_{13} is .5. One thing more has to be taken into account. The difficulty curve of the finally selected questions should be nearly normal.

After this the Reliability and Validity of the whole test are found out. For Reliability-purpose any of the following three methods may be adopted. They are:

1. Repetition of the same test on different occasions and finding out the correlation between two sets of scores. This is called Test-Retest Method.

2. Use of two parallel forms of the same Tests i.e. two forms are prepared of the same test and correlation is found out between their scores.

3. Split-half method: In this the test is split into two equal halves and correlation is found out between their scores.

Validity of the test is found by getting the correlation between the scores of the test and some outside criterion such as school-marks or teachers estimates of the students.

Note:—For detailed study of this students are advised to study *Mental Testing and Standardization of Tests* by L.P. Mehrotra and Mrs. K. Mehrotra published by Ram Narain Lal, Allahabad.

The time is also fixed for the test. Time taken by each testee is noted and the average of all is calculated. This is the standard time for the test.

What type of questions are framed in the test is given in the previous chapter. They are of the type of simple recall type, completion tests, multiple choice tests, true and false tests, matching tests etc..

STANDARDIZED TEST

Tests are of two types—teacher-made test and a standardized test. There is a difference between the two. A teacher-made test is one that is prepared by teachers for their pupils, but is not standardized. It goes through the steps of planning, preparing, trying out and evaluation but stops before standardization.

Standardization of a test goes beyond the tryout-process. At this stage the test is administered to a very large population of students say 2000, 3000 or more. The concept of standardization has two aspects—general and statistical. The first aspect means that it is relative to some standard. The statistical aspect means that a test is said to be standardized if its S.D. (standard deviation) is not more than one third of the average which means that the questions of the test are genuine and suitable for 68 percent of the sample population.

Every test is standardized with regard to its material, method and results. To standardize its material the constructed test is admministered to a large number of students and each question or item is analysed in the same way as it was done in try-out process. Standardization of method means that in the second try-out necessary changes are made in the instructions required for administering the test. The results of the test are standardized through the following methods:

a. Mean and S.D. method.

b. Percentile method.

c. Age-basis method.

The mean score of the whole population is calculated and the position of each testee, then, can be calculated in terms of S.D. value on the plus or minus side of the average. This is S.D. method. In the percentile method percentiles are calculated instead of mean and S.D. If one student's score is 62.3 and we want to know his relative position in the population, we have to find which percentile values 62.3 or near about this. If it is 60th percentile, it means that the student is better than 60 of the whole group.

In this way the test is standardized. Following are the chief characteristics of a standardized test:

CHARACTERISTICS OF A STANDARDIZED TEST

1. A standardized test is more valid. It means that it measures only the same thing for which it is meant. Unlike the traditional examinations in which speed of writing, guess, chance, linguistc ability etc. many factors influence the scores of the student, no such factor remains operative and effective, in the standardized test.

2. They are very reliable. They give the same results on repeated application. This is due to the fact that they include a large number of questions fairly representative of the content.

3. They have a meaning and a value. Each testee's score can be easily compared with the average which is cal-

culated taking about 2000, or 3000 students. If a boy's score is 65.4 and the test says that this is an score of the pupil of 13+ who has an educational age of 15+, then the boy will be considered to have had an E.Q. of 15 at the chronological age of 13+. Educational quotient (E.Q.) is calculated in the same way as I.Q. by dividing the educational age by chronological age and multiplying by hundred.

QUESTIONS

1. What is Evaluation? Discuss the concept with reference to old as well as new education.
2. Discuss some of the most important demerits of the traditional system of Examination and suggest how you can remove them.
3. What is an Achievement Test? What is the difference between a teacher-made test and a standardized test?
4. Give an account of various steps involved in the construction of a test.
5. Define:—Reliability and 'Validity'. Illustrate your answer with examples.

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APPENDIX

SOME AVAILABLE POPULAR TESTS

1. Merrill Palmer Test for children of 21 to 63 months.

2. Minnesota Pre-school scale for 18 months to 6 years old, available from Educational Test Bureau, Minneapolis.

3. Dartington Intelligence Scale—Individual Test, 4-8 years, time 3/4 hour, shortened form 25 minutes, obtainable from G. Harrap & Co.

4. Ballard's Junior Test—no time limit, 100 items, 8 to 14 years.

5. Sleight Test—non-verbal, 6 to 11 years, Harrap & Co.

6. Cattell Test Scale I—non-verbal, Group or Individual, for ages 8 to 11 years. Standardized on 620 cases, 45 to 50 minutes, A and B forms available, shortened form 20 minutes, Harrap & Co.

7. Cattell test II—verbal with non-veral items, Group or Individual, 11 to 15 years standardized on 2070 cases, time 70 minutes, A & B form provided, shortened form 24 minutes, Harrap & Co.

8. Chelsea Tests (P. B. Ballard) verbal, 10 to 14, 4 sub-tests, 100 items.

9. Columbia Tests (P. B. Ballard) Verbal, 10 to 14, 6 sub-tests, 4 or 5 minutes each, time unlimited.

10. Group Tests 34, available from National Institute of Industrial Psychology. Verbal with non-verbal items, 10 to 15 years, 9 sub-tests, 260 items. Time 38 minutes.

ADULT TESTS (14 years and upwards.)

11. Cattel Test Scale III, Verbal with non-verbal items, Group or Individual, 6 sub-tests, 151 items, standardized on 2000 adults, Harrap & Company.

12. Group Test 33 of the National Institute of Industrial Psychology.

13. Stanford and Binet, 1937's revision, two forms L-M, from Houghton Mifflin, Boston.

14. Simplex Group Tests:—Group or Individual, verbal, 10-14 years, 26 sub-tests, time 1 hour.

15. Spearman's "Measure of Intelligence", verbal, 10 to 14 years, 7 sub-tests, time 1 hour. Methuen & co.

16. Northumberland Mental Tests No. 1 Godfrey Thomson Group or Individual, verbal, 10 to 12, 6 years, 12 sub-tests, time 1 hour standardized on 25000 children. Harrap & Co.

17. Northumberland Standardized Test III Burt, Group or Individual, verbal, 10-12, 9 sub-tests.

18. Northumberland Mental Tests, University of London Press no. 2 (G. Thomson), Group or Individual, verbal, 12'6 years and above, 14 sub-tests, 60 items, time 1 hour, G. Harrap and Co.

PERFORMANCE TESTS

1. The Seguin (also called when slightly modified, the Goddard) Form Board, obtainable from Messrs. Stoelting, Chicago.
2. Ferguson Form Board, suitable for older children and adults. A graduated series of 6 boards, obtainable from Messrs. Stoelting.
3. Leake-Smith-Figure-Board, with 12 holes and 3 or more insets for each.
4. Knox-Cube-Imitation-Test.
5. Healy Picture Completion Tests, 48 pictures (10 correct and 38 alternatives).
6. Pass-along Test for 8-16 years, consists of nine graded box problems, time 29 minutes, obtainable from National Institute of Industrial Psychology.

7. Drever-Collins Performance Test:—Scale A.—8 performance tests. Some of the tests are modifications of Koh's Block Design, Knox's Cube, Drever-Collins Domino, size-weight test, Manikin, Feature Profile, Two-Figure-Board, Healy and Fernald Completion Puzzle A.
8. Alexendar Performance Tests, 3 Tests, the Passalong, the Kohs Block Design and the Cube Construction, 45 minutes time limit.
9. Porteus Maze Tests:—Vineland Revision of 1919, 13, mazes on paper, one for each year from 3-4 inclusive (except 13) and two for adults.
10. Pintner-Paterson, Two-Figure Board.
11. Gesell's Three Figure Board for infants.
12. Gwyn's Triangle Test for young children.
13. Kempt's Diagonal Board for adults.
14. Construction Puzzle A of Healy and Fernald for older children.
15. Construction Puzzle B of Healy and Fernald for adults.

TESTS OF APTITUDES

Aesthetic Ability

1. Meier-Seashore Art Judgement Test, consists of drawings, obtainable from Bureau of Educational Research, University of Iowa, U.S.A.
2. Burt's Test in Aesthetics, consists of 9 pairs of photographs.

Clerical Abilily

3. Minnesota Vocational Test for clerical workers.
4. Benge's Clerical Aptitude Test paper obtainable from Messrs, Stoelting.
5. F. F. R. Clerical Test, Institude of Educational Research Columbia University, New York.

6. O'Rourke's Clerical Aptitude Test, from Educational & Personal Publishing Co., Washington.

Drawing

7. Midland Drawing Scale for adult,—The adult is given pencil and quarto-sized paper and is asked to draw a-man in the most effective manner he can conceive. He is given 10 minutes and is rated on 5 point-scale.

Logical Ability

8. Bistol Group Reasoning Test for children with A and B two forms, from University of London Press.

9. Watson-Glaser, Tests of Critical Thinking published by World Book Co., Yonkers-on-Hudson, New York.

Mechanical Ability

10. Minnesota Mechanical Aptitude Test.

11. Cox Mechanical Aptitude Test.

12. Bennett-Fry Mechanical Comprehension Test. Form AA for school children, form BB for engineers, time 20-40 minutes, available from Psychological Corporation, 522 Fifth Avenue, New York.

Musical Ability

13. Seashore's Musical Talent Test obtainable from Messrs. Stoelting.

14. Schwartz's Social Situation Test for boys and girls of 9-13 years, 6 pictures for girls and 8 for boys, from stoelting.

15. Washington University Social Intelligence Tests for Secondary School and College, obtainable from Psychological Service, Washington, D. C.

Spatial Ability

16. Form Relation and Memory for Designs Test of the National Institute of Industrial Psychology.

ATTAINMENT TESTS

History

1. Ballard Test on History of England since accession of Henry VII, 100 items, time 45 minutes.

2. Columbia Research Bureau American History Test for Secondary School and University available from World Book Co. Yonkers, N.Y.

3. Northumberland Standardized Tests of History.

4. American Council European History Test for Secondary School and University, World Book Co., Yonkers, N.Y.

Mathematics

1. Roger's and Thurstone's Tests of Mathematical Achievement, N.Y., U.S.A.

Science

1. Caldwell's Science Tests of Botany, Chemistry, Zoology and Physics for Secondary Schools, obtainable from General Board of Education. N.Y.